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Editorial Notes

An Effect of Change

WHAT has become generally known as "slum clearance," but might be more adequately described as the task of improving the living conditions of the less fortunate among the urban community, is a social development that must result in incalculable benefit to the individuals directly concerned, and to the nation as a whole. Improved housing and more breathing space will inevitably result in better living and more robust health; so that the new order of things is to be unreservedly acclaimed. Yet, even in this case, opportunity is afforded to vary an old saw, by remarking that: "It is a good wind that blows nobody any ill"; the Commercial Gas Company being the illustration. The area of this undertaking—hemmed in on all sides, and practically innocent of any such thing as an undeveloped building site of dimensions making it worthy of consideration—is the scene of extensive schemes of "slum clearance," and the revenue is suffering accordingly. With no scope for expansion in any direction, and in parts of the area with one consumer now living where two—or even more—lived before, income must in some degree be affected.

This is the position which the Commercial Gas Company are called upon to face, and that the situation will be met successfully will hardly be doubted by anyone who heard the address of the Chairman, Mr. Frank H. Jones, to the proprietors at last week's annual meeting, or who may read the full report of it which appears in a later part of to-day's "JOURNAL." Since the beginning of the present century, there has been an estimated reduction in the populations of the Boroughs of Stepney and Poplar of nearly 30%, and in the past twelve months alone it is calculated that the reduction was well over 2%. Well, as the Chairman said, the Company have to adapt themselves to the new conditions, and they "will endeavour to fit the business to the job that they have got to do to-day." With this as a policy, no one need take a pessimistic view—far from it. Rather will those who know aught of the Gas Industry in general, or of the Commercial Gas Company in particular, feel inclined to share with Mr. Frank Jones his confidence in the future. Even during the past year, of the falling-off in consumption six industrial consumers were responsible for more than one-third, and these consumers will assuredly return to their former requirements as soon as trade conditions recover.

Let Consumers Know

THREE big London Companies whose annual meetings are reported in this issue of the "JOURNAL," as well as the two which were dealt with last week, have all had to announce small increases in the price of gas, and it is desirable that the circumstances—or at least the main circumstance—which have compelled the adoption of this distasteful course should be made widely known among the consumers. It is always a mistake to assume that outsiders are as well acquainted with anything closely touching the Industry as are those directly connected with it. An increase in the price of gas is a disadvantage to a gas undertaking engaged in keen competition with other forms of fuel—as disadvantageous to the undertaking, in fact, as it must be unpopular among the consumers whose pockets are touched. In spite of all that has been said and written, one still comes across people who think and speak of gas companies as 'though they were to-day in the enjoyment of a monopoly which enabled them to dictate their own destinies, instead of having to work out their salvation in the teeth of fierce competition. Possibly this belief will never be entirely eradicated, but at any rate the undertakings can continue to do their very best to keep the real facts of the case in the minds of "those who matter"—the consumers of gas.

Admittedly, in all cases the increases are trifling, but it so happens that they have become necessary just at a time

when the public are keenly sensitive to additional demands upon them. So be sure that consumers, wherever these increases may become unavoidable, are made acquainted with the facts, as readers will see on another page they were placed before the proprietors of the Wandsworth and District Gas Company by Mr. Frank Jones. That is to say, let it be known as widely as possible, and as emphatically as may be thought advisable, that the increases are caused entirely by circumstances beyond the control of the gas undertakings—and circumstances which are of such a general nature that not only has the Gas Industry had to increase its prices, but also the railway and transport companies, and, to a large extent, other public utility concerns. Always disliked by gas undertakings, this latest increase by the Wandsworth Company is all the more regrettable as it enforces a reduction of one-half per cent. in the statutory dividends of the proprietors, as well as a sacrifice by the co-partners. Consumers who clearly realize this community of interest will be less likely than others to find fault with an increased price.

More Users of Gas

TURNING to yet another district around London, one notes from the report of the annual meeting of the South Suburban Gas Company that they have their own particular "housing influence." That is to say, the rate of building development in the Company's area has slowed-down considerably during the last few years, with the result that, whereas in 1933 the number of additional consumers was 12,356, last year it was only 3,597. A falling-off, of course, when compared with the years of greatest housing development, but still an excellent result. During the past year there were adverse conditions experienced generally, which were altogether outside the control of the gas undertakings, but with a return to normal times, the way will be clear for a reversion to more rapid progress. In the meantime, great consolation may be derived from the fact that, even when untoward circumstances tend to restrict consumption, there is this continued expansion in the number of consumers, which means that the foundations of the Company's business are being added to unceasingly.

It was pointed out by Mr. Frank Jones that the Company now supply well over 200,000 consumers in an area of about 250 square miles, and the normal growth in the number of consumers has been of the order of nearly 70% over the last ten years. The Company's sales of gas cookers reached a new high record last year, while considerable progress was also made in the installation of large-scale cooking equipment. During the twelve months the Company sold to the public over 160,000 tons of coke, which, again, was a record, and of this nearly one-half was sold in direct trade to the actual user—largely in deliveries of a few hundredweights each. A "public utility" in its most complete sense!

Pitch as Fuel

THE state of the pitch market naturally focuses attention on the employment of this product of coal carbonization as a fuel. Reference has been made in these columns to the work of the Fuel Research Board to render its utilization for this purpose more efficient.

We now have a Paper by Mr. E. Brett Davies on the subject, and the Gas Industry will be very interested in the extract which we publish in to-day's "JOURNAL." The Paper, which was presented recently to the North-Western Section of the Institute of Fuel, dealt with the use of pitch both as liquid and in pulverized form, and ample evidence was forthcoming of the great strides which had been made in its efficient application as a fuel. Development in this direction is now assuming considerable potentialities. In the past, liquid pitch burning was largely regarded as a convenient method of disposing of surplus pitch rather than as a scientific attempt to raise steam. It would appear from the Paper by Mr. Davies, however, that an efficient method of using the material as a liquid fuel has been evolved. As the Author pointed out, most of the early troubles of pitch firing—which were often attributed to flame impingement—can be traced to excessive formation of boiler scale. When turning from the use of an inferior coal to a high grade fuel like pitch, with a calorific value some 50% higher, water treatment becomes of first importance.

Let us take a look at some of the properties of pitch as a fuel. The ash, which is exceedingly low—0·3% down to practically nothing—is for the most part a foreign inclusion and occurs as the result of corrosion of stills, pipelines, and so on. The hydrogen content is about the same as that of bituminous coal, but is considerably less than that of fuel oil. In certain circumstances this may be an advantage. The sulphur content is low, and this constitutes another advantage. The calorific value of hard pitch is approximately 16,000 B.Th.U. per lb.; that of the softer varieties may exceed 16,500 B.Th.U. The material is, of course, moisture free. Mr. Davies set out the results of a series of determinations of the constitution of pitch ash. He pointed out that the alkali content, when it occurs in any quantity, is the result of a caustic treatment practised at some tar distilleries. Such pitch, he suggested, should be avoided in furnace work. Similarly excess of lime in pitch ash should be avoided, and the practice of "liming" pitch cooling beds to facilitate the removal of the solid material should be discontinued when the material is to be used as a fuel.

In view of the facility with which pulverized hard pitch may be used, liquid burning is confined to the pitch producing works. For hard pitch suitable for pulverizing, Mr. Davies suggested an arbitrary minimum softening point of the order of 125° C.; and he drew attention to the fact that many pulverizers which are admirable for coal milling are by design not suitable for the preparation of hard pitch for burning. Appliances which have a positive grinding action fall into this category. A high-speed air-swept mill, he said, is most suitable for the disintegration of hard pitch, and grinding now presents no difficulty. He pointed out, too, that as a result of the ease of grinding of pitch as compared with coal the horse-power necessary to operate a pitch pulverizer is some 75% of that required for a similar coal mill. A feature of the ease of grinding is the reduction in wear in the pulverizer and other handling appliances. Mr. Davies stated that the life of the wearing parts of a pulverizer operating on pitch is at least ten times as great as that of a machine handling coal. As to the thermal efficiency of hard pitch as a boiler fuel, the Author put forward data giving a result of 82%. He also cited the example of a bar-heating furnace which, on conversion from oil to pulverized pitch firing, gave an increased output of some 20%. It is obvious that during the past two or three years considerable study and experiment have been devoted to the use of pitch as a fuel, and that much real progress has been effected in burner equipment and in general technique. The Paper by Mr. Davies should arouse much interest in the subject. The Author explained that it is as yet somewhat premature to give definite statements concerning

the general performance of pitch as fuel, and he did not touch on the economic aspect of the question. We hope that at a later date he will be able to amplify his information and deal with these two aspects.

Fuel Policy

"SETTING aside, so far as is humanly possible, one's own sectional bias, I see the proper fields of electrical expansion in Britain as being the huge fields of industrial power, suburban railway transport and rural development, and, in the urban domestic field, lighting in particular spheres, household power in all forms, and some portion . . . but not a very large portion, of domestic heating, cooking, and water heating. For gas and coke, the obvious and natural field is that of household heating in its three phases of cooking food, warming rooms, and heating water, and industrial heat in the provision of an exactly controllable fuel for factory furnace work of almost all kinds." We quote this from the Address which Sir David Milne-Watson gave at the Conference of the British Commercial Gas Association in October of 1937, and we turn again to that Address in view of the large amount of space devoted recently in the Electrical Press to the subject of peak loads. The cold spell of last December resulted in a long continued spate of correspondence on the question in the electrical journals.

Here is a statement typifying this correspondence: "December of 1938 brought home to those of us supplying electricity at low rates for domestic purposes the fact that poor load factor heavy current consuming apparatus may create a disastrous situation." The same writer went on to remark that the increase in maximum demands in December was due to heating apparatus with negligible load factor, but "the fact that the probable increase in such demands may amount to a menace, for reasons which are obvious, is not so much in my mind as the injustice caused to a certain class of consumer by the low rates charged by many undertakings for cookers. . . . There must be many instances where supplies for cooking are provided at a loss."

The whole point, of course, is that halfpenny-a-unit electricity is possible only when the consumption does not affect the peak load and when it can then in effect be subsidized by the high rates charged for lighting. If the fixed charge for supply to undertakings is £3 per kW of maximum demand, it is easy to see what the effect of even a 2 kW electric fire would be when put into use on the maximum demand. The correspondent to whom we have referred himself carried out a little calculation—assuming the fantastic load factor of 25%—which means the use of the fire for 12 hours a day for six months of the year. At £3 per kW the standing charge would be £6. The cost of the units delivered by the undertaking would, at 0·284d. per unit, be £5 3s. 8d. The revenue at ½d. per unit would be £9 2s. 6d. The loss would be £2 1s. 2d. He went on to remark that "one needs little imagination to appreciate what happens if instead of using 2 kW of heating during a cold snap a consumer increases this to 20 kW of heating, as did one of our consumers in a house with three bedrooms."

If electricity were to replace gas in the heating field to any considerable extent the price of current would soar. A widely extended use of electricity for heating in the home would also mean the improper use of the nation's fuel resources.

Progress in America

THE American Gas Industry had a good year in 1938. Its customers grew to the formidable total of 17,135,000—a record figure. Manufactured gas supplied 9,988,000 customers—a number less than that of the British Gas Industry, but not very far short. In common with ourselves, the United States had, from the Gas Industry's conception of good weather, an unfavourable year. It was unusually mild. In spite of this, domestic sales of manufactured gas—for uses other than house heating—showed an increase of 1·5%. House heating, which is assessed separately, showed a gain of 10%, while industrial sales were up by about 1%.

This increase of 1·5% is the first to be recorded since 1929, since when, apart from house heating, there has been a steady decline in domestic sales. During that period, of course, millions of new and more efficient appliances have been installed in place of old ones having a higher consumption, and this must account for a considerable proportion of the decreased output. In all the circumstances the Industry did well to stop the recession.

House heating by central gas burners and equipment, as we have said, showed an increase of 10% and is now a considerable proportion of total sales. That this load is in a field which, with attractive tariffs for gas, will allow of vast expansion there is no doubt, though there is plenty of competition from oil and coal. It would seem, too, that, in common with ourselves, the American Gas Industry must increase its efforts to develop the water heating load. The potentialities of this load are enormous, and gas is certainly in a strong competitive position. As a matter of fact, the sales promotional activities of the American Gas Industry towards stimulating the domestic use of gas continued their rapid growth in 1938. National campaigns on gas cookers, water heaters, and refrigerators must have quickened public appreciation of the value of gas service for the major needs of the home. In the current issue of the *American Gas Association Monthly* it is remarked that the national advertising campaign has been a powerful factor in the domestic sales position and it is deemed more than a coincidence that the tide of domestic sales did not turn until the campaign was well under way.

Mining Engineers Celebrate Jubilee

The Institution of Mining Engineers celebrated its 50th anniversary on Feb. 15, when Colonel Sir Frank R. Simpson, Bart., took over the Presidency. Mining engineering, like gas engineering, runs to a large extent in families, and it is interesting to record that Sir Frank's late father once occupied the Presidential Chair, and that his grandfather was, in his day, a prominent member of the Council. The Presidential Address, as was natural on such an occasion, made a historical survey of progress during the past half-century—from the technical viewpoint, of course, and very properly refraining from discussion of the commercial aspects which at the moment are the subject of controversy with other industries, including our own. The Institution's record of technical progress is indeed an enviable one, especially as regards its influence on accident prevention, though, as the President rightly pointed out, there is still no scope for complacency in this respect.

The high light of the celebrations was the Jubilee banquet on the same evening, when a gathering of some 550 members and their guests were received by the President and Lady Simpson in the historic setting of Guildhall. The top table was a distinguished one, the principal speaker appropriately being Capt. H. F. C. Crookshank, Secretary for Mines, who consented, at very short notice, to take the place of Lord Runciman, prevented by indisposition from attending.

Letters to the Editor

Economics of Benzole Recovery

SIR,—I read your editorial on Feb. 8 on Benzole Recovery with some considerable interest, and although your remarks may appear to be convincing to the uninitiated I am afraid they do not make me in the very least penitent.

I am sending this letter in fairness to those who may yet be considering the installation of such a plant and also in the hope that you will be kind enough to find a corner for this justification of my Paper.

In the first place you begin by urging greater efforts for the development of the coke market. I am sure all of your readers will endorse all of your aspirations in this direction. The present large coke stocks in some parts of the country have already done more than words to make the Industry aware of its shortcomings in marketing this by-product.

It is quite true that I do not have a coke fire myself. I find my gas fire quite satisfactory, thank you! After all it still is primarily the *Gas* Industry—or isn't it?

Again you quote Mr. Waller's Paper as having substantial arguments in your favour. Let us examine just a few of his statements.

On his own showing Mr. Waller had a gas yield of 79·2 therms/ton before extraction which dropped after extraction to 69·2 therms/ton. Very simple arithmetic—mere subtraction, in fact, shows that his loss was 10 therms/ton for a yield of 2 gallons of benzole.

Now just for one moment suppose he had no additional expense whatever, you will surely agree that 22d. for a loss of 10 therms is equal to 2·2d. per therm. Does he sell his gas at 2·2d. per therm. Who can? To make matters worse he has, and admits, some expenses and overhead charges, which reduce his net revenue to 10d. per gallon. From this figure, however, the deduction of quite a number of further expenses has been omitted altogether, such as those extra costs with producers, purifiers, coal and coke handling, labour, retort repairs, repayment of capital, &c., to mention a few. In another part he does allow for some of these charges and arrives at a net additional revenue of 5·58d. per gallon. Taking his own figures without my amendments his valuable customer is paying him $\frac{2 \times 5{\cdot}58}{10} = 1{\cdot}116$d. per therm. Moreover, he charges himself with steam at 6d. per 1,000 lb. because he *thinks* he has a *waste*-heat boiler. Such are the pitfalls into which misnomers lead us. Ask him how many cwt. of producer fuel he requires per ton of coal carbonized, and if he doesn't have a hand fired boiler as well.

In his Paper, too, he quotes the percentage returns of residuals on cost of coals at different gas-works in Scotland. The figures purport to show the advantage of (*a*) those undertakings recovering benzole against (*b*) those not doing so. These were:

—	1.	2.	3.	4.
A	70·2	70·81	75·70	76·74
B	74·2	51·28	66·86	59·5

In a tone of bewilderment he remarked when reading these that "one fortunate works did have the surprising figure of 74·2." Need I tell you that it was Dunfermline? Further, he conveniently quadruples his income when he declared "a potential gas consumer of 65,000 therms per annum at an industrial rate of *4d.* per therm would yield a gross income of £1,083, also with a resultant increase in coke production and this selling price is undoubtedly economic." Even allowing that his 4d./therm were correct and that that was to him such a profitable price, why then can he not sell his gas on such favourable terms? Or, for that matter, who is selling gas at that price without a block scale or two-part tariff?

I must admit that your claims to a reduction in sulphur would provide a much more realistic argument. I am not going to admit, however, that the Industry should actually commit suicide because it has suddenly acquired an awareness of this century-old sulphur bogey.

Some progress has been and no doubt more will be made in overcoming this trouble, but please let us attack the problem directly.

You criticize my efforts by saying that I started off on the assumption that the extra coke could not be sold. That is not true at all. I started off on the *fact* that it is *not being sold*, which is quite a different basis.

In my Paper I tried to point that one gallon extraction was equivalent to 10% increase in coke production and correspondingly 2½ gallons would be about 25% increment. No amount of effort is going suddenly to dispose of the astronomical number of tons this represents. Added to that, when the disarmament programme falls off, as it surely will, the steel business will follow suit and then further millions of tons of the coke oven product which happily for us are being absorbed there will then be competing in our markets Short of eating the stuff, I can't imagine how it is all going to be disposed of, and certainly not economically.

I claimed a profit of £541 per gallon extracted on the sole condition that the price of coke did not fall below 25s. per ton. Most of benzole plants were installed when coke was 30s. or over per ton with a handsome profit, I grant you, under these conditions but a great amount of the present extraction would not be continuing at all to-day if it were not that the responsible engineers did not feel morally bound to do so.

Finally, I regret the intrusion of the fact that we had a deficit of £1,147 in our last year's balance-sheet. This had nothing to do with the question at all. From our point of view last year was a highly successful one financially, and our deficit could easily have been avoided but for the fact that our Committee decided, wisely I think, to charge a heavy non-recurring expenditure entirely to revenue. It may interest you to know that part of this expenditure was due to selling several hundreds of high-grade cookers at a substantial loss, which, I think, you will agree was a good service to our customers.

Consideration for your space alone forbids any further comment.

Yours, &c.,

W. NICOL BAIRD.

Gas-Works,
Dunfermline,
Feb. 13, 1939.

SIR,—I read Mr. Baird's contribution on the subject of Benzole Recovery in your issue of Feb. 1, and would like to make a few comments on some of the points raised:

1. Benzole recovery will increase coke stocks and cause a general lowering of coke prices.
2. To reduce coke stocks by making C.W. gas is not economical.
3. To make C.W. gas will reduce the amount of coal to the retorts with a consequent reduction in the revenue from benzole.

In the first place, any additional market for gas will normally increase the coke stocks, but this does not stop undertakings using every possible means to increase gas sales. Using his own figures for calculation, an alternative customer for the therms required for benzole recovery would necessitate 520 extra tons of coal being carbonized with an extra 234 tons of coke for sale. The result is that when the customer is benzole therms, the extra net amount of coal carbonized is 940 tons with an extra 694 tons of coke for sale.

Incidentally, the yield of coke for sale based on the extra coal carbonized where the customer is benzole therms is 14·8 cwt. per ton of coal carbonized, compared with 9 cwt. of coke with normal gas sales.

It must be conceded that a high coke yield per ton of coal is very desirable assuming the manufacturing costs per therm have not been increased. Coke prices are influenced more by competitive fuels, coal and oven coke, than by the stocks held by an individual undertaking, and if dumping of fuel at a low price takes place in any district, this will determine coke prices.

The problem of coke prices is one which individual policy affects relatively little, particularly the maintenance of coke levels.

Mr. Baird makes the statement that C.W. gas made in a water gas plant is uneconomical, although, in effect, in a steamed vertical retort he is making water gas and carburetting it with benzole at 11d. per gallon, and it is taking at least a gallon per 1,000 cu.ft. for the purpose. Benzole recovery means reducing the water gas yield in a steamed vertical retort in order to allow the benzole to be recovered.

The production of C.W. gas might become inevitable if the coke question was dealt with by a national body and each undertaking agreed to reduce its "coke for sale" to some agreed ratio of the coal carbonized, but this would be a policy not dictated by consideration of benzole recovery.

Finally, with regard to the "Benzole Recovery Data" given, I cannot agree that the therms extracted per gallon are 1·6, especially as it most probably refers to "crude" benzole. The increase in producer fuel and the amount of ashes, &c., is based on an arithmetical calculation on the assumption that the amount of fuel used in the producers, per ton of coal carbonized, is the same irrespective of the amount of water gas being produced, which is an assumption with which I cannot agree.

Purification costs are stated as being increased, owing to the extra volume of gas "made" to meet the benzole demands; this figure is put down as 0·06d. per gallon. On a volume basis this is equivalent to 1·2d. per 1,000 cu.ft., which is obviously incorrect.

Another item of interest is the steam consumption on the benzole plant which will provide extra revenue to the steam raising plant of £87 net and probably represents surplus steam for which, otherwise, there would be no financial return.

Yours, &c.,
F. FIRTH,
Chief Chemist.

City of Leeds Gas Department,
Market Hall, Leeds, 2.
Feb. 16, 1939.

"Meters and Standards"

SIR,—With reference to the Paper discussed at a recent meeting of the London and Southern District Junior Gas Association ("JOURNAL," Jan. 25, p. 230) it is rather surprising to read the criticism of Mr. J. H. Bingham, of Metropolitan Gas Meters, Ltd.

The Statutory Rules and Orders issued by the Board of Trade are quite clear that a meter giving evidence of a mechanical defect practically prevented in good meters shall not be stamped.

Noise in meter working is direct evidence of internal trouble and few inspectors would pass a meter which would be bound to give the purchaser, or user, cause for complaint.

I go further and ask Mr. Bingham would he expect us to stamp a meter with the case damaged, even if it did pass all the tests imposed by the Regulations?

An inspector has (or takes) a certain amount of discretionary power, and if his object is to save trouble and expense to the seller and purchaser and annoyance to the consumer, why question his authority?

Yours, &c.,
G. S. J. KNOTT.

Public Control Department,
Gas Meter Testing Office,
Kennington, S.E.,
Feb. 17, 1939.

British Women's Hospitality Committee

SIR,—Many business women from abroad are now in London for the British Industries Fair, some of them visiting this country for the first time.

I think it will be agreed that it was never so necessary as now for women of the different countries to get to know one another, and by personal contact and friendship to establish a greater understanding.

The British Women's Hospitality Committee are extremely anxious to welcome Britain's overseas women guests and to arrange private hospitality for them.

If these women from Empire or foreign countries who are making their visit to England will get in touch with me at the New Century Club my Committee, under the Chairmanship of Lady Muriel Gore-Browne, will be delighted to arrange hospitality for them and to help to secure such social, business, or professional contacts as they may seek.

Yours, &c.,
M. CORBIN,
Secretary,
British Women's Hospitality Committee.

New Century Club,
12, Hay Hill,
Berkeley Square, W. 1,
Feb. 13, 1939.

Personal

The retirement is announced of Mr. A. I. SEATON, A.C.I.S., Secretary of the Harrogate Gas Company, after forty-six years' service. Since he commenced his duties with the Company, Mr. Seaton has seen the area served extend from 24 to about 200 sq. miles, and the Company's output has increased by more than 450 million cu.ft. In his retirement, Mr. Seaton will retain his associations with the Company as a Director, which position he has held since 1936.

He will be succeeded as Secretary by Mr. FRANK W. ALLUM, of the Brighton, Hove, and Worthing Gas Company.

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Mr JAMES CARLISLE, Accountants' Department, has been promoted to Chief Accountant of the Belfast Gas Department.

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Mr. J. F. LORD has been appointed Deputy-Engineer to the Darlington Gas Department. He was previously Engineering Assistant with the Department.

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The post of Assistant Engineer and Manager to the Motherwell Gas Department has been filled by the appointment of Mr. DAVID GARDNER, until now Technical Assistant at the works.

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It was reported at the Annual General Meeting of the Portsmouth and Gosport Gas Company last week that Alderman LEONARD N. BLAKE, LL.B., the present Lord Mayor of the City, has been elected to a seat on the Board of Directors. Alderman Blake has had a long record of public service in Portsmouth, together with a varied experience in administration, both in municipal work and in his legal capacity.

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On Feb. 16, Mr. A. R. LEA, of the Birmingham Gas Department, was the recipient of a presentation made by the Chief Chemist, on behalf of the Chemical Staff, on the occasion of his resignation from the Department to take up the position of Technical Assistant to the Leamington Priors Gas Company.

In making the presentation, reference was made to the fact that he had recently obtained the B.Sc. Degree of London University. He is a member of the Midland Junior Gas Association, and his many friends in Midland gas circles will wish him success in his new post.

Obituary

We regret to announce the death of Mrs. WILLIAM LISTER, wife of the Manager of the Fakenham Gas and Coke Company, at the age of seventy-four.

* * *

The death occurred on Feb. 16 at his home, 63, Wellington Road, Edgbaston, Birmingham, of Mr. CHARLES BURT ROBINSON, Chairman of the Midland Tar Distillers, Ltd.

* * *

We announced last week the very much regretted death of Mr. FRANK E. BIRD, Australian Manager of West's Gas Improvement Company, Ltd., in Sydney on Tuesday, Feb. 14, at the early age of 61.

Mr. Frank Bird joined the staff of the Company in January, 1894, as a pupil of Mr. John West. After completing his training in the shops and drawing office he went abroad for the Company and erected horizontal retorts and machinery in Copenhagen, and inclined retorts in Milan. In 1907 he was responsible for the erection of the first installation of Glover-West vertical retorts at St. Helens, and later for that of the installation at the Droylsden Station of the Manchester Corporation Gas Department. In 1911 he went to Australia to erect the first installation of vertical retorts at Sydney, and subsequently became the Manager of the Company's Australian branch.

Mr. Bird was well-known in Masonic circles in Australia and New Zealand.

* * *

We regret to record the death at Weston-super-Mare, where he was living since retirement from business, of Mr. THOMAS EDWARD UPJOHN, for some years a member of the Council of the Society of British Gas Industries.

Mr. Upjohn, who was in his seventy-ninth year, joined the firm of Lloyd & Lloyd in 1874, and was appointed a local Director of Stewarts & Lloyds, Ltd., in 1920, retiring in 1933. A leading figure in commercial circles in the Birmingham district, he was for several years a member of the Council of the Birmingham Chamber of Commerce. The sympathy of his many friends in the Gas Industry will be extended to his widow and three daughters.

News of the Week

The Area of Supply of the Whitby Gas Company has been extended to include the villages of Sandsend and Sleights.

The Glossop Gas Company has withdrawn its House of Commons petition against the Stalybridge, Hyde, Mossley, and Dukinfield Transport and Electricity Board Bill.

An Exhibition of gas appliances, with daily cookery demonstrations, is being held this week from Feb. 21 to 24 in the Philp Hall, Kirkcaldy, by the Corporation Gas Department.

Mr. W. J. G. Davey, B.Sc., of the Parkinson Stove Company, Ltd., gave a very interesting lecture on modern cooker design on Feb. 14, which was attended by employees of the Bewdley, Kidderminster, and Stourport Gas Companies.

Copies of the Following Recently Issued B.S. Specification can be obtained, price 2s. each, from the Secretary, The Institution of Gas Engineers, 1, Grosvenor Place, S.W. 1: No. 818.1938—Cast-Iron Straightedges (Grades A and B).

Strange but True! A fire was caused at the showrooms of the Blackburn Corporation Gas Department, King William Street, on Feb. 17, when an electric wire on the lift fused. It was fortunately extinguished before a great deal of damage had been done.

An Application from Cockfield Parish Council for a supply of gas has been received by the Darlington Town Council, who have decided that the application be borne in mind when the next Board of Trade Order for extending the gas area of supply is being sought.

A Net Profit exceeding £9,000 for the financial year 1938-39 is expected by the Salford Gas Department. This sum is in addition to £10,000 contributed by the Department towards the relief of the City rate. The profit made by the Department in 1937-38 was £18,121.

A Recommendation to Increase the Price of Gas has been made by the Burnley Gas Committee to the Town Council. The proposed increase is 1d. per therm, or 5d. per 1,000 cu.ft., making the price 8d. per therm for quarterly meter users or 8·692d. for those using the prepayment system.

Among Those Showing at an exhibition recently organized by the Douglas Gas Light Company in the Palais de Danse, Douglas, were Messrs. R. & A. Main, Ltd., J. Wright & Co., Ltd., the Parkinson Stove Company, Ltd., Richmonds Gas Stove Company, and Sidney Flavel & Co., Ltd.

The First of a Series of addresses on gas water heating was given at Dumfries Gas-Works on Feb. 16, Mr. S. C. Johnstone, Engineer and Manager, presiding over a large attendance of heating engineers and plumbers. Mr. C. A. Busby, Scottish Manager of Ascot Gas Water Heaters, Ltd., gave the lecture.

Under the Auspices of the Glasgow Corporation Gas Department and the B.C.G.A. a display of films bearing on the Gas Industry was shown on Feb. 13 in the Glasgow and West of Scotland College of Domestic Science. Miss Margaret Melvin, J.P., Principal of the College, presided over an audience of 800 persons and expressed her appreciation of the films shown.

Estimates of the Manchester Gas Committee were submitted at a special meeting of the City Council held on Feb. 15. Provision is made for the expenditure on capital account of £10,000 on cast-iron mains and £20,000 on meters, cookers, and fires during the year to March 31, 1940. The total estimated expenditure on revenue account for the year ahead is £1,218,200.

An Informal Luncheon was held under the auspices of the British Chemical Plant Manufacturers' Association on Feb. 14, at which Swedish chemical engineers, who were visiting this country, were present as guests of the Association. An interesting discussion followed the luncheon, and it is hoped that this direct contact will prove a useful means of opening up a market in Sweden for British chemical plant.

The Inventions Competition of the Foire de Paris is open and free to all inventors of any type of apparatus, &c., which has not been submitted for any previous competition, and a declaration to that effect must accompany each entry form. Entry forms and full details may be obtained at the London Office of the Foire de Paris, 17, Tothill Street, S.W. 1, and must be completed and returned by March 31.

Nearly Ten Miles of New Mains were laid by the Woking District Gas Company during the past year, said Mr. Frank H. Jones in his Chairman's Address to the shareholders at the annual meeting on Feb. 14, making the total length in the area 143 miles. Mr Jones added that for the first time gas was available and in use in the Pirbright Camp and Inkerman Barracks as a result of the Company's mainlaying operations during the year.

The Fourth Lecture of the Season to the staffs of the Sales and Distribution Departments of the Sheffield and District Gas Company took place at the chief showrooms, 15-17, High Street, on Feb. 17. On this occasion Mr. A. Russell, of Messrs. Fletcher, Russell, & Co., Ltd., Warrington, gave a talk on "Large-Scale Cooking Apparatus." He confined his comments to special apparatus required in hotels, canteens, hospitals, and similar institutions. The lecture was illustrated by lantern slides which included a number of actual installations.

An Extremely Successful Series of cookery lectures were given during last week at the showrooms of the Falmouth Gas Company to crowded attendances, people on several occasions having to be turned away. The demonstrations were capably given on modern streamlined cookers by Miss D. M. Gillham, B.P.T.C., of Messrs. R. & A. Main, Ltd., a popular feature being the cooking of complete four-course meals in the oven without attention. The recent demand for cookers has been exceptional for the town, over fifty having been supplied since the beginning of the year.

The Annual Dinner of the Institution of Chemical Engineers was held at the Hotel Victoria, London, on Friday last, Dr. William Cullen, the President, in the Chair. The toast of the Institution was proposed by Sir Alexander Walker and response was made by Dr. Cullen. "Our Guests" was in the hands of Mr. F. Heron Rogers, President-elect, reply being made by the Hon. S. M. Lanigan O'Keeffe, C.M.G., High Commissioner for Southern Rhodesia, and Mr. Gilbert S. Szlumper, C.B.E., President of the Institute of Transport. Dr. Herbert Levinstein proposed "The President," and Dr. Cullen responded.

An Exhibition of gas appliances was opened on Feb. 14 in Peterhead Rescue Hall, under the auspices of Peterhead Corporation Gas Department, the opening ceremony being performed by Provost Max Schultze, who said the Undertaking was now in its 60th year and throughout these years gas had always been supplied to consumers at a lower rate than that prevailing in neighbouring burghs. The financial position of the Undertaking was excellent. At the end of their financial year on May 15 their total indebtedness would be under £5,000 and their assets would be at least double that amount. The Undertaking was a successful example of municipal enterprise.

A Well-Attended Meeting of the London and Home Counties Branch of the Institute of Quarrying was held on Feb. 15 at the Mapleton Hotel, London, when a film on "Tar Carpets" was shown by Mr. W. E. Cone, Technical Adviser to the British Road Tar Association. A running commentary on the film given by Mr. Cone was much appreciated by members, and was followed by an interesting discussion. The film and Mr. Cone's commentary were of great interest, showing and explaining the remarkable progress which has been made in this type of road surfacing. Mr. Hugh Davies proposed a vote of thanks to Mr. Cone, and this was seconded by Mr. Frank Wells. Mr. Cone suitably replied.

Institution of Gas Engineers

Members of The Institution of Gas Engineers will be welcome at an Extra General Meeting of the Institution of Mechanical Engineers, to be held at the Institution of Mechanical Engineers, Storey's Gate, St. James's Park, S.W. 1, on Friday, Feb. 24, at 6 p.m. A Paper will be presented by Dr. Adolf Meyer on "The Gas Combustion Turbine."

Tickets for this Meeting can be obtained on application to the Secretary, The Institution of Gas Engineers, 1, Grosvenor Place, London, S.W. 1.

Cannock Coal Complaints

Findings of Committee

A report of the hearing, by the North Staffordshire Committee of Investigation, of a complaint by Gas Consolidation, Ltd., on behalf of itself and its subsidiary Company, Cannock District Gas Company, Ltd., appeared in our issue of Feb. 1.

As we go to press, we learn that the Committee have announced their decision, and the effect of the findings may be summarized as follows:

On the First Complaint.

(1) There was undue delay in granting consent for sale of coal.
(2) It amounted to a refusal to give consent.
(3) This was considered to be against the public interest.
(4) The price at which it was finally given might be described as "prohibitive."
(5) The complaint as to difficulty in obtaining consent was justified.
(6) They recommended that decision should be made more quickly in future.
(7) They thought that the Executive Board should take up with the Mines Department the question of prescribing, on any amendments of the Scheme, a period within which decisions should be made.

On the Second Complaint.

(1) The Committee considered that the price of 16s. 1d. per ton at pit (which the Executive Board substituted for their first price of 18s. 1d.) was too high.
(2) They recommended 15s. 6d. as a fair price.
(3) They recommended that the total tonnage should be the 2,000 tons required, and not the 1,500 tons specified in the consent.
(4) They made no recommendation and expressed no opinion as to Clause 55 of the Scheme.
(5) They made no recommendation and expressed no opinion as to the validity or merits of the alleged contract by the Complainant to buy at 16s. 1d., but they were of the opinion that there was no misrepresentation or suppression when that alleged contract was negotiated, and that both parties acted in good faith.

Gas Service at Castle Bromwich

The great part which gas plays in the work behind the scenes at the Birmingham Section of the British Industries Fair is testimony to its modernity and efficiency. In the 13 bars and restaurants 52 Ascot gas water heaters have been installed exclusively for the hot water requirements. From the large Ascot multi-points which feed the dish-washing machines with hot water for millions of dirty pieces of crockery and cutlery, to the Ascot boiling water appliance serving boiling water at a turn of the tap for millions of cups of tea, there is an unfailing service—an instantaneous service—which only gas could give.

In the bars—where a continuous and rapid supply of clean glassware is so essential to the serving and satisfaction of customers—Ascot boiling water appliances are continually in operation. Their utility, however, is by no means confined to the glassware, as they prove invaluable for washing down the counters and serving hot drinks of all kinds. In this latter respect a Public Analyst's bacteriological report on hot water from an Ascot has proved that ". . . the treatment the water undergoes in the heater practically renders it sterile"—or purer than the mains' supply. This point must be of added importance when considering a water supply that is to all intents and purposes in disuse for the greater proportion of every year.

London & Counties Coke Association

Annual Meeting of Distributors' Branch

The Second Annual General Meeting of the London and Counties Coke Association Distributors' Branch was held on Feb. 3 at Gas Industry House, under the Chairmanship of Mr. JOHN CHARRINGTON, Jnr. (Chairman of the Central Committee of the Branch).

The Meeting was open to Distributors' Local Representatives, and approximately 90 members and guests were present.

The Annual Report of the Central Committee, covering the period from July 1, 1937, to Oct. 31, 1938, had been printed and circulated to all concerned, and this was received and adopted.

Mr. CHARRINGTON, in his remarks, alluded to the progress that had been made since the first annual meeting, particularly in regard to the important matter of co-operation and goodwill between producers and distributors. The introduction and operation of what has become to be known as "the New Rule," whereby distributors undertook to contract for at least the same tonnage of associated coke in 1938-1939 as they had taken during the previous year, had been a valuable stepping stone in this respect.

As to the Government Departmental Enquiry into the Costs of Distribution of Solid Fuel, he was pleased with the co-operation of the producers resulting in the London and Counties Coke Association submitting evidence on behalf of both producers and distributors. Together with Mr. R. W. Foot and supported by Mr. Boon he had given oral evidence before the Commission on Jan. 31, 1939.

When questions and suggestions were invited, Mr. C. C. CLARKE, of London, asked if steps could be taken to ensure an adequate supply of suitable coke as, when, and where required, to meet the additional demand for open coke fires which had been created by the Advertising Campaign. He was informed that a Joint Sub-Committee had been set up to deal with specific difficulties of this nature.

Mr. R. W. FOOT (Chairman of the London and Counties Coke Association's Central Committee) then addressed the Meeting and congratulated the Branch on its continued success and upon the fact that on Oct. 31, 1938, there had been a membership of 4,118. He added that the producers were well-pleased with the progress of the Branch, and wished it continued success.

The area of the London and Counties Coke Association had been extended to include Cambridgeshire, Oxfordshire, Wiltshire, and Somerset, and shortly it would also include Dorset and Devonshire. He extended a welcome to the coke distributors in those new areas. As to "the New Rule," referred to by Mr. Charrington, he confirmed what had been said, and instanced that case as a striking example of what could be done by co-operation and goodwill between distributors and producers. He was pleased to see in the report the reference to the Distributors' Salesmen's Circle which he understood had been inaugurated since the printed report had been compiled. He told the meeting that the Producers' Salesmen's Circle had been most helpful, and he felt sure that much benefit would result from this new Circle, which the producers would do all they could to help.

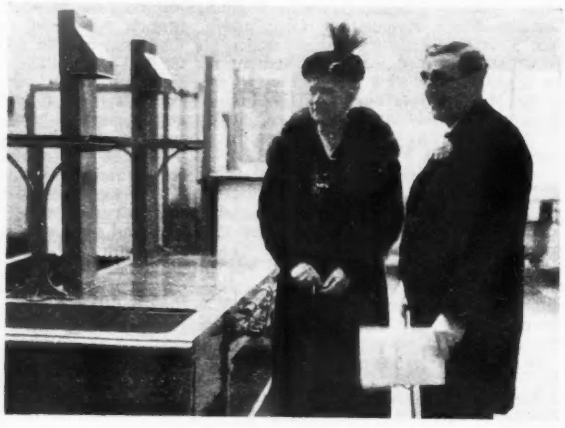
He attributed the success of the Association and of the Distributors' Branch to the goodwill and co-operation, which had established confidence on both sides that whatever might happen, each would be given a sympathetic hearing and that a fair and reasonable solution would be found. There was, of course, necessarily a written agreement, but the success did not rely upon that, but upon the confidence to which he had referred, and which he felt sure would grow stronger with experience.

After the CHAIRMAN had thanked Mr. Foot, the VICE-CHAIRMAN (Mr. J. R. Hepper) moved a vote of thanks to the Chairman, and the meeting then terminated.

A "Record" Window Display

Here is a striking window display arranged by the Bristol Gas Company to draw attention to the many new records set up by the Company in its various phases of activity during the year 1938.

Queen Mary Inspects New Hospital Kitchen



The new Luton and Dunstable Hospital, which was opened by Her Majesty Queen Mary on Feb. 14, includes two well-equipped kitchens, one for the cooking of food for patients and one for the Nurses' Home. These kitchens were planned by the Davis Gas Stove Company, Ltd. (Radiation Limited) in collaboration with the Luton Gas Company. Among the appliances installed are a double-oven "Bordo" range on stand, "Savoy" grill, "White Friar" fish range, three gas-heated hot closets, twelve hotplates on stands, "Dura" stock-pot stove and roaster. All the apparatus is finished in grey mottled enamel. Here we see Her Majesty standing beside a Radiation central boiling table with Bain Marie.

British Commercial Gas Association

Eastern District Conference

Arrangements have been completed for holding a B.C.G.A. District Conference at Bedford on Thursday, March 16, which will be preceded by a Reception and Dance in the Corn Exchange, Bedford, on the previous evening.

Professor J. D. Bernal, F.R.S., M.A., University Professor of Physics, Birkbeck College, London, has kindly promised to address the morning session of the Conference, and he will speak on the Conservation of National Resources, with special reference to Fuel.

Visits will be paid in the afternoon to works of interest, details of which are given in the programme which will be circulated a little nearer the date of the Conference.

Amalgamation and Grouping

The Morley Gas Company.

Among the objects of a Special Order for which application is being made to the Board of Trade under the Gas Undertakings Acts, 1920 to 1934, by the Drighlington and Gildersome Gaslight Company is the acquisition of the Undertakings belonging to the Morley Corporation and the East Ardsley Gas Company and to change the name of the Company to the Morley Gas Company. The Drighlington and East Ardsley Companies are controlled by the United Kingdom Gas Corporation, Ltd.

Women's Gas Council

New Branches Formed.

The Inaugural Meeting of a branch of the Women's Gas Council at North Finchley was held on Thursday, Feb. 2. Miss H. M. Ross was in the Chair, and Miss A. M. S. Wilson, Assistant Secretary, explained the work of the Council. Mrs. Squire also spoke on branch activities. Many members were enrolled at the meeting, and an interesting programme of meetings, excursions, and whist drives was proposed for the coming year.

A new branch of the Council was started at Burnley in January and over fifty members joined after the Inaugural Meeting. At a meeting on Feb. 2 a Committee and Chairman were elected.

L.-T. Carbonization in Utah

Commercial Scale Plant Proposed

We learn that the Utah Conservation and Research Foundation —a State organization for carrying out research—has arrived at the following conclusions: That from a technical viewpoint several low-temperature carbonization processes have been found to be very satisfactory for the production of a solid smokeless fuel from Utah coals; that from an economic standpoint the low-temperature carbonization of Utah coals appears to be practicable in properly designed plants placed at suitable locations; that with the data now in hand *plus* that which will be forthcoming, the Foundation will by May 1 impartially select the most suitable processes for the low-temperature carbonization of Utah coals.

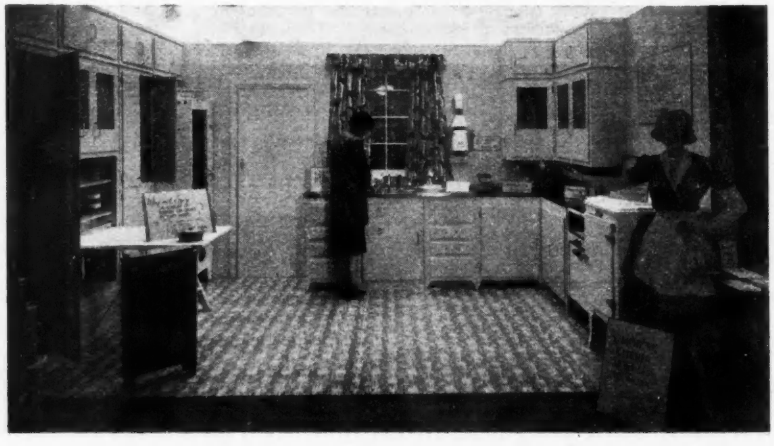
The trustees of the Foundation have made a request on the State's budget committee for $75,000 to be used for the erection and operation of a commercial scale plant.

Cefn Special Order Application

The Cefn and District draft Special Order application, we learn, from the Board of Trade, has been laid before both Houses of Parliament for approval by resolution. The Order is proposed to be made to the Board of Trade under the Gas Undertakings Acts, 1920 to 1934. The objects of the Order sought include provisions regarding limits of supply, share capital, the protection of the Great Western and the London, Midland, and Scottish Railway Companies, and differential price.

KITCHENCRAFT EXHIBITION AT NEWCASTLE

"This is rather different from my kitchen in the Pantomime," said Cinderella (Miss Nancy Neale) from the Theatre Royal, Newcastle, in opening the Kitchencraft Exhibition held jointly by the Newcastle-upon-Tyne and Gateshead Gas Company and Messrs. Fenwick, Ltd., in the latter's exhibition hall. This is the tenth successive year this two-weeks' exhibition has been held, at which almost continuous cookery demonstrations, housecraft lectures, and film shows are attended by as many as 12,000 persons. Among the visitors this year, in addition to Miss Neale, were Miss Jessie Matthews and Mr. Sonnie Hale. Novel demonstrations were staged under the title of "Cookery Pitfalls and How to Avoid Them"—showing how things should not be done—how sandwich cakes should be baked if they are not to fall in in the middle, for instance. The model kitchen to which Miss Neale referred is illustrated here.



A.R.P. Notes

Organization for Medium-Size Works.

We are indebted to Mr. D. McEwen, Engineer and Manager to the Leek Gas Department, for the following particulars of the work which has been carried out at Leek by way of Air Raid Precautions.

During the recent crisis, the need for workable organization of staffs of small and medium size gas-works became apparent. The chief needs were the allocation into gangs of the surplus labour—*i.e.*, men not engaged in shift duties, carbonizing, &c.—and the quick summoning of such men for protection or duty. At Leek Gas-Works the first part of this organization was easily arranged, and the following groups were constituted: Works Fires; Mechanical Breakdown; Mains Gang; Fitting Gang; Auxiliary Gang; and Motor Drivers.

Each man was chosen to do the job for which he was most fitted, while the "Auxiliary Gang" is made up of men who are particularly adaptable and are also able to drive motor vehicles. Thus there are five men who can be drafted to various gangs as required, as the two motor drivers are both gas-works trained in routine jobs.

So far the scheme presented no difficulties and all these men passed through the full "Gas Course" given to decontamination workers. The first real problem arose when it was decided to try out the summoning of this staff under the present arrangements for air raid warnings. It is fairly common knowledge that a preliminary warning is to be given, which gives executives ten minutes to put into operation such parts of their organization as will ensure the safety of the working staffs and establishments for which they are responsible. In a trial practice it was found possible to do this only if one were able to pass on the preliminary warning to all men in the groups within 20 seconds of the receipt of such a message at the gas-works. The solution of this problem became a pressing need not only for the Leek Gas-Works, but also for A.R.P. staffs generally. It appeared that however perfect the organization of working gangs, wardens, auxiliary firemen, or any other gangs, no real advantage could be taken unless they could be quickly warned in their homes so that they could reach their posts within the prescribed ten minutes. The possible arrangements for such a warning were telephones or messengers. The first is expensive and to be ruled out, as the telephone system is likely to be fully occupied, while messengers were far too slow.

This line of thought led to the "M.G." Alarm, a small device for utilizing a momentary increased gas pressure to ring a bell in the homes of any A.R.P. worker fitted with the device The reasons for choosing this increased pressure method of alarm were:

(1) Speed of operation, particularly when used where there is little or no consumption from the gas mains.
(2) No interruption of gas supplies on receipt of preliminary warning, which is confidential.
(3) Safety of such a method, as there is no danger of failure of by-passes or small flames.

This device, which is manufactured under licence by Messrs. J. & J. Braddock, Ltd., of Oldham, is now in production, and a description is published in to-day's "JOURNAL."

With this problem satisfactorily solved the complete organization of A.R.P. at Leek Gas-Works was accomplished. The procedure was tried out and found to work perfectly. On receipt of the preliminary message at the works, each man on the list is warned in his home. Key men walk into the works or are fetched by the motor drivers. This operation can be completed in about 8 minutes. Other men, having already received the warning, stand by in their own homes. Thus when the general warning is given they are ready to walk in or be fetched by motor, which operation in practice takes about 6½ minutes.

It is hoped to put down an air raid shelter to protect these men at the works.

"Pooling" Industrial A.R.P. Knowledge.

Industrial A.R.P. knowledge should be pooled and manufacturers well advanced with shelter construction and evacuation plans would do well to pass on the benefit of their experience for the good of the industrial community as a whole.

This suggestion is made by Messrs. E. K. Cole, Ltd., radio manufacturers, Southend-on-Sea, who initiate the scheme by offering, to all industrial executives, full constructional details and plans of the shelters they have built for 3,000 employees, together with information on evacuation routine and training. It is pointed out that the risks resulting from failures of individual experiments and trials, as much as their cost in time and money, call unmistakably for the most extensive co-operation and the widest exchange of information on the subject of industrial A.R.P. that can be granted.

The money and time spent on initial preparations, it is suggested, are being duplicated over and over again in all parts of the country, placing on British industry a financial burden as ill-timed as it is unnecessary. The pooling of information on industrial A.R.P. would lighten it immeasurably.

An official of the firm stresses that a co-operative effort is sought. "We do not profess that our own scheme is complete, or that it could not be considerably improved. We are seeking information as much as offering it. On the other hand, we have collected a large amount of information which may be of interest and help to others who have approached the problem from a different angle. We shall be very pleased to send details to responsible executives who care to apply and will gratefully welcome any similar co-operation they have to offer."

Testing Portable Air Raid Shelters in Manchester.

Attention has recently been drawn in the Press to the subject of portable air raid shelters. All-steel sectional shelters of varying forms provide an excellent means of protecting factory stand-by staff, wardens, watchmen, attendants, and others whose duties prevent them seeking more permanent places of safety. Obviously such structures must be capable of providing protection not only from flying splinters, but from the more general, and equally dangerous risk of injury by falling masonry. For service under these conditions a very wide factor of safety is necessary, and the test method employed by Switchgear & Cowans, the Manchester engineers, tests the efficiency of air raid shelters of their manufacture.

Local demolitions provided the site, and a number of tests were made on the *same* shelters. House walls, complete with heavy chimney-work were scientifically "dropped" direct on to the shelters without damage. It is claimed that in actual service few masonry falls could equal in concentrated severity those made at these tests, and it speaks well for the design and construction of these portable sectional shelters that they survived such drastic treatment.

Buildings Allocated at Leicester Works.

The Leicester Gas Committee have allocated buildings at the Aylestone Road Gas-Works for A.R.P. purposes. They will be fitted as a decontamination centre, and the Committee agreed that as far as possible all members of the Gas Department should have first-aid training.

Forthcoming Engagements

February

23.—B.C.G.A.—District Meeting at Birmingham.
23.—B.C.G.A.—Annual Meeting of Members in Scotland, North British Hotel, Edinburgh, 2.30 p.m.
23.—Southern Association (Eastern District).—Meeting at Gas Industry House, 2.30 p.m. Discussion on "Payment of Commission to Employees."
23.—Joint Junior Visit to B.I.F.
25.—Scottish Juniors.—Joint Meeting at Edinburgh. Paper by M. Whittaker, of Robert Dempster & Sons, Ltd., on "Gasholders."
25.—Yorkshire Juniors.—Meeting at Barnsley Technical College. Paper by H. K. Lister, of Holmfirth, "Personal Experiences on a Small Gas-Works."
February 28-March 2.—B.G.F. Joint Gas Conference.—B.I.F., Castle Bromwich. (For programme, see "JOURNAL" for Jan. 25, p. 220.)

March

2.—Midland Juniors.—Paper by F. N. Tidball, "Structural Principles in the Design of a Waterless Gasholder."
4.—Manchester and District Juniors.—Annual Dinner. Paper by E. Bates, "Operation of Intermittent Vertical Chamber Ovens Combined with Coke Dry Cooling Plant."
6.—I.G.E.—Joint Committee on Complete Gasification under Pressure, 2.30 p.m.
6.—L.C.C.A.—Technical Committee, 11.30 a.m.
7.—B.C.G.A.—Executive Committee, 2.30 p.m.
7.—I.G.E.—Research Executive Committee, 2.30 p.m.
9.—B.C.G.A.—Annual Meeting of Members in Eastern District at Cambridge.

Gasholder Tank Inspection

We describe in this article a method used for several years by the Gas Light and Coke Company to allow a diver to enter gasholder tanks. The holder, it should be mentioned, requires to be out of commission and purged.

Diver entering Holder *via* the Temporary Box.

THE holder is inflated with air until the outer lift is about three parts out of the tank. At one or more places around the periphery of the outer lift a shield is fixed on the inside of the holder.

The shield is made of mild steel sheets in convenient pieces for handling, the edges of each sheet being preferably flanged outwards so that they may be bolted together from the raft inside the holder. This flanging also stiffens the structure. The sheets may, of course, be stiffened by steel sections if desired. The size of the shield is such that the belt fixing holes are outside the riveted seams of the lift side sheeting. This applies to width and height and is dependent upon the size of the lift sheets, but it is usual to make it a little larger in width than two side sheets and about three sheets in height. This is clearly seen in the photograph.

The method of fixing the shield is quite simple. The outer lift is inflated to almost blowing point, and the sections of the shield are "fished" under the bottom curb on to a raft. The lift is then lowered to the position at which the shield is to be fixed. The sections which are attached to the outer lift side sheets are then fixed, the bolt holes having previously been drilled from a templet and filled with corks or plugs. The remainder of the shield is then built up, the joints being made with one of the usual cements such as "Scots."

When the shield has been fixed, the side sheets of the outer lift which lie within the area covered by the shield can be removed by cutting out the rivets.

A diver will usually cover the bottom of a tank up to 100 ft. diameter from one entry shield, going halfway in either direction. For larger diameter tanks two or more access points are necessary.

To remove the shield it will be found that the original lift side sheets may be re-fixed in position except possibly one or two. These are replaced by lowering the lift into the tank so that the opening is submerged below water. The top of the shield is removed which gives room to tack bolt the remaining side sheets through the top longitudinal rivet holes. This is done below water level. The lift is then inflated sufficiently to remove the remainder of the shield sections enabling the last side sheets to be completely re-riveted.

National Gas Council

Central Executive Board Meeting

A Meeting of the Central Executive Board of the National Gas Council was held at Gas Industry House on Tuesday, Feb. 14. In the absence of the Chairman (Sir David Milne-Watson), the chair was taken by Mr. GEOFFREY KITSON (Vice-Chairman).

Death of Professor Arthur Smithells, C.M.G., D.Sc., F.R.S.—Very great regret was expressed at the death of Professor Smithells, which occurred on Feb. 8. Members were reminded that Professor Smithells was one of the first members of the National Gas Council when it was formed in 1916. It was reported that a letter of sympathy had been addressed to Mrs. Smithells on behalf of the President, Vice-Chairman, and Members of the Board. A vote of sympathy was recorded by the Board.

National Emergency.—It was reported that a meeting of the Emergency Committee had been held on Jan. 17 to deal with matters of urgency in connexion with the national position. Among the questions discussed was that of the classification of employees, indicating those who were indispensable for the carrying on of the undertaking. The steps which were being taken to deal with this matter were reported and approved.

Air Raid Precautions.—The deputation from the Management Committee of the Manchester District Executive Board which had appeared before the A.R.P. Department of the Home Office on Jan. 27 was reported.

Coal Mines Act, 1938.—*To report decision of the Durham District Committee of Investigation in the case of Newcastle-upon-Tyne and Gateshead Gas Company.*

It was reported that the Committee of Investigation had decided against the contention of the Newcastle-upon-Tyne and Gateshead Gas Company, and that steps had been taken for the case to be re-heard by the Central Appeal Tribunal. The hearing would take place at the beginning of March.

Coke for Inland Sales.—The steps which had been taken to complete the organization in the various districts and from the national point of view were reported and approved.

Benzole Recovery.—Replies which had been received to the Council's circular letter to gas undertakings despatched on Dec. 21, 1938, were reported.

Income-Tax.—A report was submitted with regard to the negotiations which had taken place with the Inland Revenue with regard to the suggested revision of the agreement which was negotiated in 1912. The Board approved of the continuation of negotiations on the basis reported, on the understanding that the Committee should report to the Board from time to time and submit the final agreement before ratification.

British Gas Federation.—A meeting of the Council held on Dec. 21 was reported when the following matters were considered—viz.:

(*a*) *Dinner of The British Gas Federation to be held on Monday, Nov.* 20, 1939. Appreciation was expressed at the action of the Council of The Institution of Gas Engineers in postponing their Autumn Meeting to Nov. 21 and 22 to allow of the Dinner taking place on the Monday preceding these dates.

(*b*) *Exhibitions Committee.*—It was reported that the Council had approved of a Joint Committee being set up of representatives of the Publicity Committee of the British Commercial Gas Association and representatives of the Society of British Gas Industries, and it was further reported that Mr. John Terrace had agreed, on the invitation of the Council, to act as independent Chairman. The Joint Committee will take the place of the exist-

ing Exhibitions Committee and will report from time to time to the Council and to the Executive Committee of the British Commercial Gas Association and to the Council of the Society of British Gas Industries.

Conjoint Conference of Public Utility Associations.—The proceedings of the Seventh Annual General Meeting of the Conjoint Conference held on Jan. 26 were reported. Appreciation was expressed of the appointment of Viscount Falmouth as President of the Conference and of the re-election of Sir David Milne-Watson and Mr. William Cash as Vice-Presidents, also of the election of Lord Pentland as Vice-President in place of Viscount Falmouth.

It was reported that Alderman Sir Albert Atkey had been nominated by the Water Interests as Chairman for the ensuing year, and Mr. Thomas Hardie and Mr. W. B. Woodhouse had been nominated as Vice-Chairman of the Gas and Electricity Interests respectively. Mr. Ogilvie and Mr. G. P. Warner Terry had been re-appointed Joint Hon. Secretaries.

It was reported that the following matters were under discussion:

Rating: (*a*) Re-valuation of Public Utility Undertakings during the quinquennial period.
(*b*) Valuation in Kent.
(*c*) Departmental Committee on Valuation for Rates.
Report of the Mains and Cables Committee.
Mining Subsidence Bill.
London Rating (Sites Values) Bill.

Railway Rates and Charges.—(*a*) *In Great Britain.* A Joint Memorandum issued by representatives of the Railway Companies and of the Road Haulage Industry with regard to the agreement which had been reached was considered. The steps to be taken for the protection of the Gas Industry were considered and approved. (*b*) *In Eire.* It was unanimously decided to support the Irish Board in the evidence which they proposed to submit before the Commission which had been set up to report on public transport.

New Offices for the Scottish Board.—A report was submitted and approved with regard to the steps taken by the Scottish Board to secure new offices.

Joint Gas Conference.—The attention of members was drawn to the Programme of the Joint Gas Conference on Feb. 28 and March 1 and 2, and it was reported that the Presidential Address would be delivered by Lord Kennet on Tuesday, Feb. 28. [For full programme, see "JOURNAL" for Jan. 25, p. 220.]

Date of Annual Meeting of the National Gas Council.—It was unanimously decided that the Annual Meeting this year should take place at Gas Industry House on Tuesday afternoon, May 9.

An Air Raid Warning Device

IN the official A.R.P. Memorandum No. C.1 (2nd Edition), which sets forth the organization of Air Raid Precautions for Gas Undertakings, one of the sections (No. 6) is devoted to warnings and communications.

This section deals with the desirability of passing on the telephoned warnings to key men of the staff, so that such men can be quickly collected for action or protection. It is urged that such a plan be put into action now. This problem is not confined to gas undertakings. A method of warning all key men on A.R.P. staffs, such as wardens, first aid workers, auxiliary firemen, and decontamination staffs is required, along with those of gas, water, and electric staffs. Such warnings should be given, quickly, privately, and without the use of a possibly overloaded telephone system.

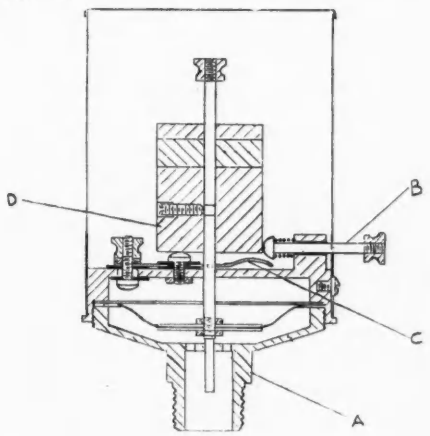


Fig. 1.

A new device has now been produced which has the very great advantage of meeting the full requirements of A.R.P. and at the same time cheapness and efficiency. By fitting the warning device in the gas service of each key man's home, it is a simple matter to warn him when he is needed for duty.

The operation of the device is dependent upon a temporary increase in gas pressure, controlled from the works, lifting a diaphragm which in turn releases a switch mechanism to complete an electric circuit with a bell and battery. In order that the operation of the device may be fully understood reference should be made to the drawing. (Fig. 1.)

The lower part of the diaphragm chamber (A) is screwed into a convenient point in the gas service. The diaphragm is held to this lower part of the chamber by a top cover which carries the switch mechanism. The mechanism comprises a spring loaded push rod (B) which under normal gas pressure conditions is prevented from making contact with the phosphor bronze strip (C) by the diaphragm loading weight (D). This strip forms one pole of the switch, and is insulated from the diaphragm chamber which forms the other pole. A wire from the strip is led to one connexion in the bell and battery circuit while the other connexion is made to the body of the diaphragm chamber as previously mentioned.

Under normal gas pressure conditions the diaphragm is loaded sufficiently to keep the push rod from making contact with the insulated strip. When it is necessary to send the warning the gas pressure is temporarily increased at the works and this pressure wave upon reaching the switch device raises the loaded diaphragm. The rising weight allows the push rod to move forward and make contact with the strip and so complete the circuit and ring the bell. The bell continues to ring until the push rod is pulled out sufficiently to allow the weight to drop and keep the rod out of contact with the strip.

The device is inexpensive yet effective, and should provide the answer to one of the problems of the A.R.P. authorities. Practical tests in various parts of the Leek District have proved that the bells can be rung within 15 seconds of receipt of a telephone A.R.P. warning at the gas-works.

If the holder pressure is insufficient to provide the extra "pressure wave" a small booster could be employed for this purpose.

The device is manufactured under licence by Messrs. J. & J. Braddock, of London, Oldham, and Wolverhampton, who would be pleased to supply further details to those interested.

Miss Jessie Matthews and Mr. Sonnie Hale were among distinguished visitors to the Newcastle Kitchencraft Exhibition, referred to on another page. Here we see the famous stage and screen stars examining a gas cooker.

Athletic and Social

Recreation Club for Exmouth Employees.

The Exmouth Gas Company Recreation Club was formally opened on Jan. 25 by Mr. W. E. Dean, Managing Director of the Company, who is also President of the Club.

The Club premises, which have been provided by the Directors in connexion with the construction of new stores and fitting shops at the works in Fore Street, cater for a staff of about seventy-five employees, and are of most commodious and up-to-date character, with modern furnishings and equipment. The accommodation includes a spacious lounge with facilities for darts, table tennis, and card games, a bagatelle room, kitchen, and other offices.

Mr. W. E. Dean, performing the opening ceremony, said that to some of the older employees the recreation Club premises had been a long time materializing, but the difficulty, as they knew, was in providing the room. The site of the works was none too large, in view of the expansion of the business, but the opportunity came with the building of the new stores, and the Directors had been happy to provide the employees with this means of social intercourse. Mr. E. T. Linscott (Chairman of Directors) had taken the keenest possible interest in the project, and if he could have been present that evening he would have given them a warm welcome to the Club. Mr. Dean added that he was pleased to know that so many employees had taken advantage of the facilities provided, and he trusted they would make good use of the premises.

Mr. Dean commented that during the year he would have completed twenty-five years of service with the Company, and it was a pleasure to see so many of the employees of the Company who had grown up around him during that period.

Mr. W. E. Baker (Assistant Manager) expressed the thanks of the members of the Club for the excellent accommodation provided by the Directors, whose generosity was greatly appreciated. It was up to the members to show the true spirit of goodwill and comradeship, and to do everything possible to make the Club a success.

Mr. C. Crutchley (Chairman of the Club) voiced the thanks of the members to Mr. Dean for the kindly interest he had taken in the provision of the Club premises. He said it was a red-letter day for the employees, and they wished to make it a red-letter day for Mr. Dean. On their behalf he presented the President with a handsome case of briar pipes, as a token of their good wishes, and with the hope that the gift would provide him with many hours of pleasure.

Mr. Dean said it would be a great pleasure to him to convey the feelings of the employees to the Directors. He felt the Club would be an excellent means of bringing the Directors and the employees more closely together for the well-being of the Undertaking.

Mr. W. Gorfin, on behalf of the visitors, congratulated the members of the Club on the excellent premises they had acquired, and said the efficient development of the gas undertaking, under the management of Mr. Dean, into the biggest single industry in the town, and one of the finest undertakings of its kind in the country, must be a source of pleasure to all who had the interests of Exmouth at heart. The prosperity of the Gas Company was very much bound up with the prosperity of the town as a whole, and was also dependent on the excellent team spirit that prevailed among the employees.

The toast of "The Club" was proposed by Mr. A. T. Pope.

Refreshments were served by Miss Taylor and her staff, and an excellent musical programme was provided.

Cambridge Sports Club Dinner and Dance.

The annual dinner and social arranged by the Recreation Club of the Cambridge University and Town Gas Light Company again attracted a large attendance. The Chairman of the Company, Mr. J. F. Cameron presided, and was accompanied by Mrs. Cameron. The following Vice-Presidents also attended: Mr. J. Hunter Rioch (Engineer and Manager) and Mrs. Rioch; Mr. F. J. Dykes (Director) and Mrs. Dykes; Major H. McCombie (Director); Mr. H. T. Wing (Director) and Mrs. Wing; Mr. G. F. Dale (Director); Mr. W. G. Bradford (Accountant) and Mrs. Bradford.

Following the Loyal Toast, "The Cambridge University and Town Gas Light Company" was proposed by Mr. Hunter Rioch, who sketched the development of the Company from the earliest times, and in doing so made special mention of the pioneers who had laid the foundations of the present flourishing concern. In demonstration of the manner in which the Gas Industry had grown in Cambridge some illuminating statistics were provided, showing that despite difficulties and set-backs, progress had been uninterrupted. To-day there were 27,000 consumers and 3,336 public lamps. The gas output during 1938 was 982 million cu.ft., 36,000 tons of coke had been produced, 560,000 gallons of tar, and 93,000 gallons of benzole. In conclusion the Engineer and Manager referred to the difficult and anxious period during the severe weather at the end of the year, expressing appreciation of the wholehearted support which had been given by all departments, and the splendid work done by all in that trying time.

Replying, Major H. McCombie pronounced 1938 to be a quiet year, when steady progress had continued in the main duty of maintaining an adequate service to the public. In December there had been a phenomenal demand, but the Company had not failed in any respect. Speaking of the future, it was expected that the new carbonizing plant, which was largely under construction, would be in operation next winter. Besides being completely modern and efficient, it would contribute to the reduction of smoke and dust.

"The Recreation Club and its Officers" was given by Mr. H. T. Wing, who thanked the Club on behalf of all the guests for its hospitality. As a means of getting together and so fostering the spirit of good comradeship in business, such occasions were of great value. As sportsmen, members of the Gas Company's Club held a fine record, and among the consumers there was no doubt that gas men were considered "jolly good fellows." He congratulated the Club and the Officers on the success which had rewarded their efforts, and hoped that the Club would continue to prosper.

The Chairman of the Club, Mr. G. E. H. Keillor responded, and thanked the Directors, together with the Engineer and Manager for the many privileges which had been granted. With its splendid record the Club had an incentive to make the new season better than ever.

In appreciation of his services as Chairman of the Club for 14 years a fountain pen and pencil, suitably engraved, were handed to Mr. Arthur Bowman by the President. Novelty competitions, dancing, and a special item by the Thermonic Quartette were also features of a memorable evening.

Chertsey Employees' Gathering.

Mr. F. G. Matthews (Engineer and Manager) presided over an attendance of about 75 at the annual social gathering of the employees of the Chertsey Gas Consumers Company held in the Constitutional Hall. Among those present were some of the Company's pensioners.

At the outset Mr. Matthews, on behalf of Sir David Milne-Watson (Chairman) and the Directors, welcomed those present and expressed the hope that they would have an enjoyable evening. Mr. A. J. Saunders (Secretary) also read a letter from Sir David, regretting his inability to be present, and wishing the guests a very enjoyable evening.

The toast of "The Company" was given by Mr. A. Brown, who took the opportunity of thanking the Directors and management for the splendid evening they had provided. He would also like to take the opportunity of thanking the Company for the generous way they were treating the men who had reached the retiring age, and he wished health and prosperity to the Chertsey Gas Consumers Company.

The response came from the Chairman, who, on behalf of Sir David and the Directors, thanked the company for their kind sentiments, which were highly appreciated. That evening gave him an opportunity of striking a more or less personal note, and that was to thank them for their loyal and good work during the past year. He gave them all a hearty welcome, and hoped they would spend a pleasant evening.

Mr. A. T. Ledger replied on behalf of the guests, and expressed appreciation for the kind invitations. There were representatives present of the South-Eastern Corporation, the Windsor and Ascot Gas Companies, and he was sure the employees were also very pleased to see their old Chairman (Mr. Wells) and their old friend Mr. Summers.

Hull Cricket Club's Whist Drive and Dance.

The Members and friends of the British Gas Light Company (Hull Section) Cricket Club, to the number of 650, attended the annual whist drive and dance at Beverley Road Baths. Whist prizes were presented by Mrs. C. Rhodes Armitage, wife of the Engineer and Manager, who was presented with a bouquet by Mrs. J. C. Nunn.

Brook's Band provided the music, and Mr. H. Barley was M.C. The President (Mr. C. Rhodes Armitage) and Mrs. Armitage's party included the Chief Constable (Mr. T. E. Howden) and Mrs. Howden, Mr. and Mrs. Y. Braithwaite, Mr. E. W. Bonsey (District Superintendent), Mrs. Bonsey, Mr. Purcell (Sales Manager), Mr. and Mrs. Broadbent, and Miss Hart.

Arrangements were carried out by Messrs. N. A. Mawer and C. W. Applebee (Hon. Secretaries).

The Use of Pitch as a Fuel - - -

by
E. BRETT DAVIES

From a Paper to the North-Western Section of the Institute of Fuel, Feb. 7.

The pitch referred to in this Paper is coal tar pitch produced in the distillation of the coal tar.

In the past, the export of pitch for briqueting purposes, together with its use in this country for road-making purposes, have practically absorbed the production of British pitch, but during the past two to three years, an increase in production, together with the vagaries of the export market, have led to an examination of other possible outlets, and the development of the use of this material as a fuel is now assuming considerable potentialities.

The distillation of the crude tar is generally arrested when the specific gravity of the distillate has reached a point which from experience is known to leave a pitch with a softening point in the region of 70° C., since such pitch has been in most general demand for export purposes. At such a softening point the temperature of the pitch at the completion of the distillation is approximately 360° C. When pitch with a higher softening point is required such as the "hard pitch" used in the pulverizing process, the distillation is prolonged to a higher end temperature, which in the case of 125° softening point pitch, is in the vicinity of 400° C.

TABLE I.

Sample No.	1		2		3		4		5	
Softening point, ° C.*	153	70	130	70	123	70				
Volatile matter, %	39·5	68·6	59·5	76·5	50·6	70·3	46·8	70·2	64·2	70·2
Ultimate analyses—										
Ash	0·11	0·13	0·18	0·18	0·28	0·23	0·18	0·06	0·06	0·05
Carbon	92·65	90·42	89·74	87·48	92·47	90·34	91·17	89·53	90·66	89·30
Hydrogen	4·08	5·23	5·39	6·02	4·32	5·03	4·80	5·61	4·90	5·60
Oxygen (diff.)	1·18	2·19	2·40	4·14	0·76	2·09	1·92	2·99	2·10	2·89
Nitrogen	1·41	1·38	1·58	1·50	1·48	1·47	1·48	1·38	1·42	1·41
Sulphur	0·57	0·65	0·71	0·68	0·69	0·84	0·45	0·43	0·86	0·75

* These softening points and others quoted elsewhere are by the method of Kraemer and Sarnow.

Table I shows the softening points, volatile contents, and ultimate analyses of a number of samples of pitch taken to represent the average make throughout the country.

Considering these figures from a fuel point of view, it will be observed that although in passing from the softer to the harder pitches a considerable decrease in volatile takes place, yet the volatile content, even of the harder pitch, is greatly in excess of that of bituminous coal. The ash figures call for little comment; ash is for the most part a foreign inclusion in pitch and occurs as the result of corrosion of stills, pipelines, &c., and an increase in this constituent in passing from soft to hard pitch is normally to be expected. The carbon content exists in pitch both in a combined and a free state; the quantity of this latter is increased by the cracking of hydrocarbons during a prolonged distillation and also varies with the origin of the crude tar. The hydrogen content is substantially the same as that of bituminous coal, but is considerably less than that of fuel oil, with the result that, in converting from this latter fuel to pitch, furnace atmospheres will be found to contain substantially less water vapour, which in many cases is beneficial to the process for which the furnace is employed. The sulphur percentage is pleasingly low and a concomitant reduction in the corrosion of steel chimneys and other furnace equipment would be anticipated from the use of this fuel.

The calorific value of pitch varies with its hydrogen content, and observation has shown that the calorific value of hard pitch with a softening point of 125° C. is approximately 16,000 B.Th.U. per lb., while that of the softer varieties may exceed 16,500 B.Th.U. Since the material is moisture free the net calorific value may be computed from the hydrogen contents as given in Table I and will be found to give an average net figure of some 15,500 B.Th.U.

In order to examine the possibility of contamination by ash in certain types of furnace work, a series of determinations of the constitution of pitch ash was obtained and is quoted in Table II.

TABLE II.

Sample No.*	1		2		3	5	
	Hard.	Soft.	Hard.	Soft.	Soft.	Hard.	Soft.
Silica	13·08	5·06	4·91	12·10	2·44	8·88	3·28
Ferric oxide	49·10	65·27	75·46	57·09	42·32	71·00	79·45
Alumina	0·12	0·63	7·84	9·40	0·28	1·74	2·92
Titanium oxide	0·58	0·50	0·37	0·16	0·20	0·23	0·58
Manganese oxide	3·76	0·59	0·18	0·36	0·63	0·59	0·03
Sulphate	10·91	12·55	3·05	12·96	22·54	3·16	5·42
Lime	7.55	9·95	1·35	2·00	2·20	2·70	2·70
Magnesia	2·63	3·82	1·95	2·83	2·16	1·11	1·12
Alkalies, &c.	11·27	1·63	4·89	3·10	27·23	2·59	4·45

* These sample numbers correspond with those in Table I.

It will be observed that the ash consists largely of ferric oxide which would substantiate the previous statement that the ash content is the result of corrosion of the tar stills. The alkali content when it occurs in any quantity, such as in Sample 3, is the result of a caustic treatment practised at some tar distilleries. Since alkalies exercise a fluxing action on refractories such pitch should be avoided in furnace work where this corrosive action is likely to have a marked effect. Similarly excess of lime in pitch ash should be avoided and the practice of "liming" pitch cooling beds to facilitate the removal of the solid material should be discontinued when the material is to be used as a fuel.

Pitch Burning.

Two methods of using this fuel are commonly employed; at pitch producing works where the material is available as a hot liquid, it is largely burnt as such, while for other than tar-works purposes the pitch is allowed to solidify and is delivered to the consumer as lump hard pitch. This solid material is crushed, pulverized, and burnt, using methods analogous to those employed in pulverized coal firing practice. From time to time the practicability of delivering hot liquid pitch in lagged tanks, or of re-melting the solid material for use as a liquid fuel, has been discussed, but there are considerable technical difficulties attached to these processes, and in view of the facility with which pulverized hard pitch may be used, liquid burning is at yet confined to the actual pitch producing works.

Liquid pitch has been used as a fuel for Lancashire boilers for a number of years. The softer variety of pitch is generally employed and the method of burning is similar to oil burning, using steam as an atomizing agent. In some cases oil burners have been adapted for pitch, but in general a type of burner is employed which produces very long and uncontrollable flames and the general effect of such a flame is often to be found aggravated by the practice of lining the first 6 ft. to 10 ft. of the combustion chamber with refractories to prevent alleged "flame impingement" troubles. In

such circumstances the heat is transferred to the back end of the boiler and the flues and the advantage of enhanced calorific value largely dissipated. It is only fair to state that in the past liquid pitch burning has often been regarded as a convenient method of disposing of surplus pitch rather than as a scientific attempt to raise steam.

From the results of past experience and recent developments in pitch burning it is now felt that an efficient method of using this material as a liquid fuel has been evolved. Many, if not all, the early troubles of pitch firing, which were often attributed to "flame impingement," can be traced to excessive scale formation, and whereas when firing Lancashire boilers with an inferior coal, probably sludging frequently and generally ignoring efficiency, performance so far as could be ascertained was satisfactory, when turning to a high-grade fuel with a calorific value some 50% higher than the coal previously used, water treatment, often in the past neglected, becomes of paramount importance. Assuming that the water has been adequately softened, it is felt that the only protection necessary in the boiler combustion chambers is some 3 ft. of refractory brickwork placed around the hot zone of the pitch flame, where it will also serve to re-ignite the flame in the event of a temporary stoppage in the system.

The Burner.

The use of steam as an atomizing medium may be largely responsible for excessive flame length since the mass of pitch particles and steam which is internally inert must travel a considerable distance before encountering externally the necessary secondary air for combustion. In using air or a mixture of air and steam for atomizing, the disintegrated mass is partially combustible internally and burns much more readily with a shorter flame. Several burners are available which in practice have been found to produce flame lengths less than 6 ft. when burning pitch at the rate of 25 gallons an hour

One pound of pitch requires some 200 cu.ft. of air for its combustion, a fraction of this quantity may be used as atomizing air, but the method of introducing the remainder has a most important bearing on the flame characteristics. A radial type of secondary air inlet can be used. Its effect is to shorten the flame and at the same time to produce a marked stabilizing effect whereby the pitch supply may be varied in quantity within wide limits without causing "spluttering." With an installation embodying the above principles evaporation figures of 11 lb. of water per lb. of pitch should be obtained, while the CO_2 in the flue gases should average 15% without an emission of black smoke.

Pulverized Hard Pitch Firing.

Since hard pitch may be transported with the same facility as coal or any other solid fuel it has consequently a much wider range of application than the liquid pitch previously discussed. It is stated above that by continuing the distillation process to a higher end temperature a pitch may be produced which can be pulverized and burnt by methods analogous to those used in pulverized coal firing practice. It is now necessary to examine these statements more closely. In the first place, there is no definite softening point which marks the limit between pulverizable and non-pulverizable pitches. Indeed the grindability is not a direct function of the softening point, and the whole question awaits examination. It is, however, true in a general sense that as its softening point decreases, pitch is more liable to adhere to the vulnerable parts of the pulverizing installation. With this in view it is felt that an arbitrary minimum softening point should be established to define hard pitch suitable for pulverizing, and experience would indicate that this softening point is of the order of 125° C. by the method of Kraemer and Sarnow.

Secondly, many pulverizers admirable for coal milling are intrinsically unsuitable for the preparation of hard pitch. In this category must be placed ball, tube and edge-runner type mills, and similar appliances which have a positive grinding action. Hard pitch has been found to become decidedly adhesive in such mills, due presumably to the heat caused by the grinding, and once adhesion commences the building-up process accelerates rapidly. It is found that a high-speed air-swept mill is most suitable for the disintegration of hard pitch, and in this country the type known as the "Atritor" has been found to give excellent results. Using this pulverizer the actual grinding of the hard pitch now presents no difficulty, although, naturally, every installation has its own particular problems in other directions.

For pitch, the burner nozzle is essentially simple in design, and should be free from obstructing "spreader" devices, since these when they become hot by radiation encourage the building up of softened pitch particles. The velocity of flame propagation of pulverized pitch is considerably higher than that of coal, and is thought to be of the order of 80 ft. per second. It is consequently necessary to arrange a nozzle velocity in excess of this figure in order to avoid combustion in the burner.

Secondary air is normally admitted around the burner, and, when this latter is not water-cooled, exercises a beneficial cooling effect. As in the case of liquid-burning, the method of admitting this secondary air can be adjusted to produce a long, sweeping flame or a short, wide flame, according to the requirements of the furnace.

It has been noticed that as a result of the ease of grinding of pitch as compared with coal, the horse-power necessary to operate a pitch pulverizer is some 75% of that required for a similar coal mill. Another feature of this ease of grinding is the considerable reduction in wear in the pulverizer and also in the other handling appliances. The life of the wearing parts of a pulverizer operating on pitch is at least 10 times as great as that of a machine handling coal. The pulverizing of pitch and its combustion involves an electrical consumption of some 15 kv.a. per ton, including the operation of a secondary air fan.

With regard to the applications of hard-pitch fuel, although there are numerous plants in operation in this country, it is as yet somewhat premature to quote definite statements concerning the general performance of this fuel. The following authentic data would be quoted as an indication of the possibilities of pulverized hard-patch firing:

Test of 9 Hours' Duration on Two 30 ft. by 8 ft. 6 in. Lancashire Boilers.

Equipment—			
Two "Atritor" pulverisers, each taking 15 h.p.			
One secondary air fan driven by a 5-h.p. motor.			
Pitch consumed in 9 hours		14,410	lb.
Water evaporated		16,422	gall.
Steam pressure		83	lb./sq.in.
Evaporation factor		11·4	
Flue gases	CO_2 varying from	15% to 18%	
	O_2 " "	1% to 4%	
	CO " "	*Nil*	
Temperature at base of stack		155° F.	

Taking pitch at 16,000 B.Th.U. per lb., these figures give a thermal efficiency of 81·5%.

NOTES.—The low flue-gas temperature is due to the economizer originally serving our coal-fired boilers.

That these figures are in no way abnormal is shown by the monthly returns for December last, which gives an average evaporation factor of 11·2 lb. of water per lb. of pitch.

Pitch-Fired Reverberatory Furnace.

This furnace which is used for the reduction of tin ores was previously oil-fired, and the following data shows the comparison between oil and pitch:

	Oil.	Pitch.
Fuel per 1,000 kilos of ore	1,206 lb.	1,289 lb.
Calorific value of fuel	19,000	16,000 B.Th.U./lb.
Therms per 1,000 kilos	229	206

The total charge in each case was approximately 40,000 kilos, and the duration of the run was 10 hours.

It will be observed that in using pitch an increase of the thermal efficiency of some 10% was obtained.

In a third case, although concise furnace data are not available, a bar-heating furnace feeding a bolt-making machine was converted from oil to pitch, and the output of the furnace increased by some 20% to a figure of 40,000 ¾ in. by 3½ in. bolts per day.

Pitch has also been used most successfully for billet-heating and for vitreous-enamelling muffles, and, apart from numerous Lancashire and water-tube boiler installations, work is at the moment proceeding on the use of this fuel in the glass, cement, and other industries.

ASPECTS OF
The Factories Act

by
A. RONCA,
Works Regulations Officer, Gas Light and Coke Company.

A Paper read to the London and Southern District Junior Gas Association on Feb. 14 at a meeting held at the Home Office Industrial Museum—the PRESIDENT (Mr. S. C. Waldock, of the Gas Light and Coke Company) in the chair.

The main objects of the Factories Act are to ensure safe and healthy working conditions for all factory workers.

The expression "Factory" is defined in Section 151 as meaning:

Any premises in which, or within the close or curtilage or precincts of which, persons are employed in manual labour in any process for or incidental to any of the following purposes, namely:

(*a*) the making of any article or of part of any article.
(*b*) the altering, repairing, ornamenting, finishing, cleaning or washing, or the breaking up or demolition of any article, or
(*c*) the adaption for sale of any article, being premises in which, or within the close or curtilage or precincts of which the work is carried on by way of trade or for purposes of gain and to or over which the employer of the persons employed therein has the right of access or control.

You will observe that use is made of the expression "premises," which does not necessarily mean buildings only, but is wide enough in its meaning to include both buildings and open yards, &c., in which the processes enumerated are carried on.

Though the expression "premises" includes both buildings and their adjuncts, it does not follow that the whole of a building, even though occupied by a single firm, would be viewed as a factory. Only such parts of the building as are used for a factory process would come under the requirements of the Act.

In fact, in Sub-section 6 (Section 151) it is definitely stated where a place situated within a factory is solely used for some purpose other than the process carried on in the factory, that place shall not be deemed to form part of the factory for the purposes of this Act.

The application of the definition is limited by the words "by way of trade or for the purpose of gain." There are many manufacturing operations which are not carried out directly by way of trade or for gain, but merely as an incidental to some other business. The words "trade or gain" mean direct trade or gain, and for this reason it has been necessary to enumerate various other processes and sites to bring them within the scope of the Act. So far as the Gas Industry is concerned, two of these extended definitions of the term factory are of interest, viz.: Section 151 (xiii) which reads:

"And (whether or not they are factories by reason of the foregoing definition) the expression 'factory' also includes the following premises in which persons are employed in manual labour—that is to say: Any premises used for the storage of gas in a gasholder having a storage capacity of not less than five thousand cubic feet."

Sub-section 4 extends the term "factory" to cover any workplace in which, with the permission of or under agreement with the owner or occupier, two or more persons carry on any work which would constitute the workplace a factory if the persons working therein were in the employment of the owner or occupier, shall be deemed to be a factory for the purposes of this Act.

Consumer's Premises.

Consider now the processes enumerated in item (*b*) of the definition—viz., the altering, repairing, ornamenting, finishing, cleaning or washing, or the breaking up or demolition of any article, in conjunction with the term workplace as used in Sub-section 4. At first it would appear that the maintenance work on the premises of a private consumer might come within the terms of the Act, but, though in certain circumstances the right of entry exists there is no right of control. Further there appears to be no legal definition of the term "workplace," which seems to imply a site at which some form of manual work is carried on not at intermittent periods but regularly. Thus, though maintenance work is carried on in a consumer's house, it is still a private house and not a workplace.

The position is, however, different where the consumer's premises are constituted a factory by the nature of the business he carries on there and Section 64 (3) requires that in the case of all accidents causing:

(1) the loss of life of a person or
(2) disables a person for more than three days from earning full wages,

the injured person's employer must notify the occupier of the factory as well as H.M. Inspector of Factories of the occurrence.

Gas-Works, &c.

Obviously all gas manufacturing works and processes come within the scope of the Act, but the extended definition of the term factory includes all gasholders of a capacity of 5,000 cu.ft. and over, irrespective of whether they are situated on a works or situated on a site used only as a gasholder station.

Gasholders.

It must be remembered that though Section 33 relates to water-sealed holders only, the definition laid down in Section 151 (xiii) covers all types of gasholders.

It is, therefore, necessary to register all gasholder stations with H.M. District Inspector of Factories and to keep the various Abstracts and Registers at these sites.

Boiler inspection reports, and the prescribed record of examination of water-sealed gasholders to be kept in accordance with the terms of The Gasholder (Record of Examination) Order, 1938, No. 598, are important technical records, and it may happen that it is difficult to make arrangements for their safe keeping at the holder stations. If this is the case application should be made to H.M. District Inspector of Factories to exercise his powers under Section 116 of the Act and approve another more suitable site.

Though the Act does not specify any details as to the care of or the examination of the piston and high-pressure types of gasholders, there is no doubt that the recommendations of The Institution of Gas Engineers as made in their communications:

No. 144 3rd Report of the Gasholder Committee, Nov. 3 and 4, 1936,
No. 171 4th Report of the Gasholder Committee, Nov. 2 and 3, 1937,

will be the accepted standards of good practice.

The requirements of Section 33 relate to water sealed gasholders of a capacity of 5,000 cu.ft. and over. Briefly they require that:

(1) Holders to be of sound construction.
(2) Properly maintained.
(3) A thorough external examination to be made at least every two years by a competent person.
(4) A record of such examinations giving prescribed particulars to be attached to the General Register.

(5) If any lift of a holder has been in use more than 20 years the internal state of the sheeting must be examined by a competent person before July 1, 1940.

(6) After July 1, 1940, the internal state of the sheeting must be examined every ten years.

(7) The internal state of the sheets shall be ascertained by cutting samples from the crown and sides or by other sufficient means.

(8) Samples and the report of the person making the examination must be kept available for inspection.

(9) The occupier shall keep a record showing the date of construction of the oldest lift of the gasholder.

(10) Where there is more than one gasholder they shall be marked with a distinguishing number or letter.

In the case of the repair or demolition of a water-sealed gasholder the Act stipulates it must be carried out under the supervision of a person who is competent by:

(*a*) his training and experience and

(*b*) his knowledge of the necessary precautions against the risks of explosion and persons being overcome by gas.

Competent Person.

In this and other sections of the Act the undefined term "competent person" is used, but if close consideration be given to Sub-section 6 of this Clause, the words "by his training and experience" leads to the conclusion that a competent person must have sufficient practical and theoretical knowledge together with actual experience of the type of plant which he has to examine, as will enable him to detect any defects or weakness and to assess their importance in relation to the strength and functions of the plant.

Responsibility.

It is for the occupier or his agent, who in most cases is the Works Engineer, to ascertain that the person undertaking the examination, repair, or demolition, is competent, and his responsibility in matters of this kind cannot be avoided. In point of fact, the responsibility of preventing any breach of the regulations rests with him, as is shown by Sub-section 5 of Section 130, which states: "Where an offence under this Act committed by a company is proved to have been committed with the consent or connivance of, or to have been facilitated by any neglect on the part of, any director, manager, secretary, or other officer of the company, he, as well as the company, shall be deemed to be guilty of the offence and shall be liable to be proceeded against and punished accordingly.

The question of responsibility is one of serious consideration. It is clear that the Act places the responsibility of complying with its requirements not only with the factory owners but also with their managers and other officers. Ignorance is no excuse in the eyes of the Law, and it is right and proper to expect those who adopt works management as their sphere of occupation to familiarize themselves with the Factory Act, which, after all, is the legal basis on which all factory processes must be conducted.

It might seem strange to stress this point at this juncture, but there is a reason for doing so, as not only is Section 33, respecting water-sealed gasholders, new to the Act, but also Section 27, relating to precautions to be taken where dangerous fumes are liable to be present, and Section 28 respecting precautions to be taken where inflammable or explosive dust, gas, or vapour is present. These two sections are, of necessity, of paramount importance when work on gas-works plant, which contains or has contained gas, is undertaken.

The failure to carry out the requirements of these Sections might, in the event of an accident, be considered to have "facilitated the accident by neglect." The person in charge of such work must, in his own interest, make sure that his foremen and men know the safe method of procedure, and clearly understand the duties allocated to them and that the prescribed rescue and first-aid appliances are available.

Plant Containing Gas, &c.

The requirements of Section 27 apply where work has to be done inside any chamber, tank, vat, pit, pipe, flue, or similar confined space in which dangerous fumes are liable to be present to such an extent as to involve the risk of persons being overcome.

Briefly the requirements are:

(*a*) Unless there are other adequate means of egress, manholes of the following dimensions must be provided on:

i. Fixed plant—
Circular manholes 18 in. in diameter or rectangular or oval manholes 18 in. by 16 in.

ii. Mobile plant—*i.e.*, tank wagons, &c.—
Circular manholes 16 in. in diameter.
Rectangular or oval manholes 16 in. by 14 in.

(*b*) Where plant has been proved by test to be clear of toxic gas, &c., persons may enter without life belts and lines and without breathing apparatus.

(*c*) If steps have been taken to free the plant of toxic gas, &c., but no test has been made, all persons entering the plant must wear life belts and life lines. The free end of the life line must be held by a man outside the plant.

(*d*) Where the gas has not been removed, all persons entering must wear a breathing apparatus giving full protection against the gas.

(*e*) In all circumstances the following must be available:

i. Breathing apparatus.
ii. Suitable belts and life lines.
iii. Suitable reviving apparatus.
iv. A person trained in artificial respiration who is trained and practised in the use of the apparatus and artificial respiration.

The reason for considering the question of responsibility now becomes clear, as it is obvious the requirements of this Section must receive the active interest of the Management.

Attention should be given to the dimensions of manholes, as on some of the plant constructed prior to July 30, 1937, manholes of smaller dimensions were fitted. Testing for the presence of gas can be carried out either by a chemical test or by observation of white mice.

The latter test is simple and continuous. A cage of white mice is introduced into the plant. Observation is kept on the mice for 30 minutes prior to the men entering, and if at the end of that period their behaviour is normal, it is safe for men to enter the plant. The mice, however, should be kept in the plant during the whole period of work and constant observation kept on them. In the event of the mice showing signs of gassing, the men should be withdrawn.

The second point to occupy our attention is the absolute necessity of preventing gas entering the plant after it has been shut out and prior to entry. This should be ascertained by testing by means of a water gauge.

Lastly, it is not sufficient to have breathing apparatus, life lines, and reviving apparatus. There must be a man trained and practised in their use, always remembering that there is a vast difference between the expression "trained" and that of "trained and practised"—the latter expression indicating the necessity of periodic exercise in the use of the apparatus.

Inflammable Gas, &c.

Section 28 deals with the precautions to be taken where explosives or inflammable dust, gas, vapour, or substance is present. Sub-sections (3) and (4) are of particular interest to us as they relate to plant containing inflammable gas or vapour under a pressure greater than atmospheric pressure, their requirements being as follows:

Sub-section (3).

Unless the plant is situated in the open air:

1. No fastening of any
   (*a*) pipe connected with the plant
   (*b*) cover of any opening into the plant shall be loosened before the gas is effectively shut off the plant.
2. No fastening shall be removed before the gas pressure in the plant or pipe has been reduced to atmospheric pressure.
3. Before gas is allowed to enter the plant all covers must be securely replaced and all joints soundly made.

Sub-section 4 requires that all plant that has contained ex-

plosive substances (gas, fluid, or solid) whether situated in the open air or in a building, shall not be welded, brazed, soldered, or cut by the application of heat unless:

(*a*) Before welding, &c., is begun all practicable steps are taken to remove the inflammable substance (gas, fluid, or solid) to render it inert.

(*b*) After welding, &c., the plant must be allowed to cool sufficiently to prevent ignition before the inflammable substance, as defined, is allowed to enter.

Now carefully study Sections 27 and 28 in relation to the repair of the water-sealed gasholders, and you will notice that their internal inspection, owing to the necessity of an air lock, is impossible, and that under Section 28 their repair by the electric welding process is prohibited. On these two points the appropriate authorities have made the required application to the Home Office for the necessary certificates of exemption, and we can but hope that the application will be favourably considered at an early date, so that the maintenance of water-sealed gasholders may proceed as usual during the summer months.

Means of Access.

The previous law contained no specific requirements respecting safe means of access or special precautions to be taken for men working at heights. The new Act (Section 26), however, requires that, so far as is reasonably practicable:

(1) Safe means of access must be provided and maintained to every place where any person has to work at any time.

(2) Where a person has to work at a place from which he is liable to fall more than 10 ft., unless that place affords secure foothold and, if necessary, secure handhold, fencing or other means of ensuring safety must be provided.

The question of safe access should be considered when determining the position of such essential parts of plant as valves and lubricators; and if the provision of such access is impracticable, then some safe method of working, such as chain-operated valves or extended lubricator services, should be provided. The words "from which he is liable to fall" in the second clause of the section, should be interpreted in their full sense, for they not only call for the requirements to be met on stages or walkways 10 ft. above ground level, but are equally applicable to the edges of holes, trenches, pits, &c., the bottom of which is 10 ft. or more below ground or stage level.

Further new requirements respecting the provision of guard rails are introduced in Section 18 which are applicable to every fixed vessel, structure, sump, or pit containing any scalding, corrosive, or poisonous fluid, whose edge is less than 3 ft. above the adjoining ground or stage level, these requirements are also found in the Chemical Works Regulations and are as follows:

(1) It must be securely covered or

(2) It must be securely fenced to at least 3 ft. above the adjoining ground or stage level.

(3) If secure fencing or covering is impracticable through the nature of the work carried on, all practicable steps must be taken to prevent any person falling into it.

The expression "any person" not only covers the worker, whose duties take him to the vessel, pit, &c., but also every other person in the factory.

Machine Guarding.

Before passing to this subject, it is necessary to consider three more definitions, viz.:

(1) *Prime Mover.*—The driving or power unit—that is to say, every engine, motor, or other appliance providing mechanical energy from steam, water, wind, electricity, combustion of fuel, or other source.

(2) *Transmission Machinery.*—The means of conveying motion, including every shaft, wheel, drum, pulley, system of fast and loose pulleys, coupling, clutch, driving belt, or other device by which the motion of the prime mover is conveyed to or received by any appliance.

(3) *Machinery.*—The Act does not define the term "Machinery," but states the expression includes any driving belt. This point should be remembered, as a driving belt is also considered under Section 152 (1) as being transmission machinery. The general safety provisions relating to the safeguarding of all machinery apply whether the machinery or its part is situated in an engine house or not. In other words, they apply to machines situated in process houses and yards, as well as in engine houses.

The Act requires that every moving part of a "prime mover," including the flywheel and, in the case of water wheels and turbines, the head and tail race, and all "transmission machinery," shall be securely fenced or of such construction or so placed as to be as safe for every person working in the factory as if it were securely fenced. These requirements are applicable to electric generators, motors, and rotary converters, as well as all "other machinery" with this exception, that where, owing to the nature of the operation the dangerous part cannot be rendered safe by use of a fixed guard, a device which automatically prevents the operator coming in contact with the dangerous part may be fitted in place of a fixed guard.

Section 13 contains three important requirements respecting transmission machinery—viz.:

(*a*) Devices or appliances for promptly cutting off the power from the transmission machinery must be provided in every workplace.

(*b*) Driving belts must not rest or ride on revolving shafting.

(*c*) Striking gear must be provided and used to move driving belts from the fast to the loose pulleys and the gear must be capable of preventing the belt creeping back on to the fast pulley.

Attention is particularly directed to the requirements of this Section, as they are new requirements needing the introduction of stop buttons, switches, clutches, belt perches, sleeveguards, or other similar devices which are often absent on old plant.

Section 15 gives an exemption, subject to the requirements of the Unfenced Machinery Regulations S.R. & O., 1938, No. 641, which allows male persons over 18 years of age to carry out the examination, lubrication, or adjustment of unguarded machinery in motion provided that:

(*a*) He has a written certificate from his employer authorizing him to do so.

(*b*) He wears a close-fitting, single-piece overall suit having no exposed loose ends and no external pockets other than a hip pocket

(*c*) Another person instructed how to stop the machine and act in case of emergency is within sight or hearing of the man working on the machine.

(*d*) Steps are taken, such as the erection of a barrier, &c., to prevent any other person approaching the exposed moving part.

(*e*) Any ladder used in carrying out the operation shall be securely fixed, lashed, or held firmly by another person.

In all cases where machinery is unfenced for the reason that it is considered safe by position, effective steps must be taken by the occupier of the factory to prevent anyone from getting within the danger zone while the machinery is in motion. Even certified machinery attendants—that is, those authorized to attend to unguarded machinery—must be protected by guarding all dangerous parts of the machinery, other than that which he has exposed for the purpose of his work.

Great care should be exercised before deciding machinery to be safe by position. In accepting it as safe, consideration should be given to such occasions as may call for painters, window cleaners, or lamp attendants to work in close proximity to it. Attention is directed to this matter, as it is a common fault to find machinery adequately guarded for the protection of persons working at ground level, but virtually unprotected so far as those working a few feet above ground level are concerned.

While reviewing safety precautions to be adopted for protection of the worker against injury by mechanical motion, it would not be out of place to consider the special requirements of Section 47 respecting stationary internal combustion engines.

Though essentially welfare regulations, they might in the presence of adverse circumstances be Safety requirements.

Sub-section 2 of this regulation specifies that "No stationary internal combustion engine shall be used unless:

(1) Provision for conducting the exhaust gases from the engine room to the open air is provided.
(2) Such engines (except engines under test) must be partioned off from any workroom so as to prevent injurious fumes from entering the room."

New Machinery.

An entirely new principle is introduced into the Act in Section 17 respecting the construction and sale of new machinery. It provides that in all new machines constructed after July 1, 1937, and intended to be driven by mechanical power in a factory:

(1) Every set-screw, bolt, or key on any revolving shaft, spindle, wheel, or pinion, must be sunk, encased or otherwise effectively guarded so as to prevent danger.
(2) All spur and other toothed or friction gearing which does not require frequent adjustment while in motion must be completely encased or so situated as to be as safe as if it were completely encased.

It is the factory occupier's duty to see that new machines fulfil these requirements, but it is made an offence for anyone (manufacturer, merchant, or agent) to sell, let, or hire for use in a factory a machine which does not comply with these requirements. For this reason the words "intended to be driven" must not be lost sight of, as the offence is committed whether the machine has actually been in use or not. It is, therefore, very advisable to check over all new machines at the time of delivery and notify the merchant of any failure in respect to this requirement.

Lifts and Hoists.

The question of machine guarding would not be complete without some remarks on the subject of lifts and hoists. Section 22 requires that every lift or hoist must be of sound construction and properly maintained. With these objects in view, the Act requires that:

(*a*) Every lift or hoist be thoroughly examined by a competent person.
In the case of lifts that are continuous or which are not worked by mechanical power every 12 months. In the case of all other hoists and lifts, every 6 months.
(*b*) The hoistway be protected by a structure to prevent personal injury by falls or contact with the lift cage or balance weights.
(*c*) Gates on all landings and lift cages to be of the interlocked type, preventing:

i. The landing gates being opened when the cage is not opposite it.
ii. The cage gates being opened when lift is in motion.
iii. The cage being moved before both landing and cage gates are shut.

(*d*) All lifts must be marked with the safe working load.

In the case of lifts in which persons travel, with or without goods, the following additional safeguards are required:

(1) An automatic device that prevents the cage over-running.
(2) If the cage is suspended by rope or chain there must be at least two ropes or chains separately connected to the cage, each capable of carrying the cage and its maximum load.
(3) Efficient devices to support the cage and its maximum load in the event of the failure of ropes or chains.

(*To be continued*)

London Juniors Visit Home Office Museum

The February meeting of the London and Southern District Junior Gas Association was held at the Home Office Industrial Museum, where, prior to the presentation of a Paper on the subject of the Factories Act by Mr. A. Ronca, Works Regulations Officer to the Gas Light and Coke Company, the opportunity was taken to inspect the exhibits.

The Museum is intended to be a permanent exhibition of the best methods, arrangements, and appliances for ensuring the health, safety, and welfare of the human element in industry. Its establishment was decided upon before the War; but the building, though completed then, was not fully equipped until about ten years ago. Since then the exhibits have been continually added to as new developments have come along, and it may be said that the very latest ideas on industrial safety precautions are now represented. The Museum, which is the only one of its kind in the country, is open to the general public, and all those concerned with the problems of safety, health, and welfare in industry are encouraged to visit it.

The exhibits on the ground floor are devoted to safety devices for industrial machinery, such as wire guards for belting, covers for shafting, and guards which push the operator's hands clear of the mechanism of stamping, printing, sawing, and cutting machines, &c.; also interlocking devices which necessitate both hands being used on separate controls to actuate the machine. A remarkable comparison in noise was demonstrated between an ordinary overhead power drive and a similar drive fitted with simple insulation on the brackets supporting the shafting. The gallery is devoted mainly to the welfare and medical sides. Plaster casts of limbs show various stages and conditions of industrial diseases, such as silicosis, metallic poisoning, anthrax, &c., together with explanations of their symptoms and treatment. Types of approved aprons, respirators, rubber gloves, &c., are shown, while a model works first-aid room and canteen are of interest. A further section demonstrates methods of electrical wiring, with examples of fittings which have been the cause of fatal accidents. An interesting exhibit shows the right and wrong way of wiring up electrical fittings, whereby in the one case all is properly insulated, and in another various metallic parts of the fittings become "live" at one or both positions of the switch. Interlocking devices for lift doors are also demonstrated.

In addition to exhibits contained in a room devoted to the principles and methods of illuminating works and factories, the lighting installation throughout the whole Museum in itself forms an interesting exhibit, a number of high-power gas lamps being included.

Following the inspection of the Museum, the members were granted the facilities of the lecture room for their meeting, at the conclusion of which the PRESIDENT (Mr. S. C. Waldock, of the Gas Light and Coke Company) voiced the thanks of the Association to Mr. Murray, who is in charge of the Museum, for the opportunity of viewing the exhibits, and to his staff for showing them round. He referred to the publication by the B.C.G.A. of a useful booklet which explained the clauses of the Factories Act affecting gas undertakings with reference to the installation of heating, ventilating, and water heating systems.

The vote of thanks was seconded by Mr. C. A. DEAS (Hertford) and heartily accorded. In acknowledgment, Mr. MURRAY said they were always very pleased to welcome at the Museum anyone who was interested in safety and welfare in industry.

Scottish Western Juniors

Members of the Scottish Junior Gas Association (Western District), with their President, Mr. N. C. Sturrock (Greenock), visited the Works of Messrs. W. & B. Cowan and the Parkinson Stove Company at Glasgow on Jan. 28 last, when many prominent Scottish Gas Engineers were present.

The visitors were welcomed by Mr. A. J. West, Director of Parkinson & Cowan, Ltd., Mr. R. Allan, Mr. F. J. R. Forsyth, of Messrs. W. & B. Cowan, Mr. A. Cowen, Mr. E. M. Ketteringham, and Mr. R. Fletcher, of the Parkinson Stove Company.

The visitors showed great interest in the various processes of manufacture of meters and also demonstrations of gas cookers, fires, and water heaters.

A lecture on modern cooker design with special reference to the "Renown" and "Crown" cookers was delivered by Mr. W. J. G. Davey, B.Sc., and this was followed by films showing the manufacture of meter leathers, suitably described by Mr. C. J. Cutbush. A *précis* of Mr. Cutbush's remarks is published elsewhere in the "JOURNAL."

Tea was served at the Grand Hotel, Glasgow, and the meeting terminated with a typical Scottish concert.

THE MANUFACTURE OF Gas Meter Diaphragms

Précis of a Lecture by G. J. Cutbush, given to the Scottish Junior Gas Association (Western District) at the Glasgow Works of Messrs. Parkinson & Cowan, Ltd., on Jan. 28.

Examining the Raw Skins.

Before showing a documentary film of the manufacture of gas meter diaphragms, Mr. Cutbush spent a little time in explaining one or two special points in connexion with both gas meters and their leather diaphragms. He emphasized the fact that the gas meter is both a meter and a motor, and that the less the power required for the meter as a motor, the less the pressure drop from inlet to outlet.

He summarized the desiderata for gas meters as:

(1) Accuracy of measurement at all rates of flow within their capacity, or even at overloads of 100% of their rated capacity;

(2) the maintenance of this accuracy over long periods of time—for upwards of five years—without any attention or any mechanical servicing;

(3) the very low power consumption for the meter as a motor, as shown by the small pressure loss from inlet to outlet.

It was then pointed out that even if every other part of the meter could maintain its original perfection and if the leather diaphragms merely changed in area, stiffness, or in profile at any position of their stroke, then the registration of the meter would be upset and the above-mentioned performance not maintained. The area of the leather could be affected either by loss of oil dressing or by injurious chemicals which are deposited from the gas, and it is therefore necessary to make the leather especially resistant to such chemicals and to make oil dressing as stable and insoluble as possible.

Nature and Properties of Leather.

The nature and properties of leather next came under consideration. The skins of the animals from which leather is made are highly putrescible, and if dried out without previous treatment become hard and horny and resemble parchment, but if the skins are converted with the aid of chemical tanning agents into an imputrescible form, and if, during the subsequent drying processes, the individual fibres are maintained in their separated condition, then the product is a wonderfully fibrous, flexible material.

In order to understand the variations which occur over the surface of any complete skin, it is necessary to consider the functions the skin performs during the life of the owner. Briefly the skin must not be considered as an outer wrapping such as a paper covering round a parcel, but as a set of organs which carry out the following functions:

(*a*) It is an elastic shock absorber for the protection of the underlying organs and is thickest where the greatest protection is required.

(*b*) It is a sense organ and contains the nerve endings which are sensitive to heat, cold, and touch, &c. Incidentally these nerve end patterns form the fingerprints with which all are familiar.

(*c*) It forms a protection against insects, owing to the fact that the skin is loosely attached to the underlying body by crossed muscles which enable the skin to be twitched.

(*d*) The skin is an organ of secretion and contains glands which secrete oil for the lubrication of the overlying covering such as wool, hair, &c.

(*e*) It is an organ of excretion and contains special ducts from which exude aqueous fluids containing by-products such as urea, &c.

(*f*) It is the body temperature regulator; in other words, Nature's solution to the problem of thermostatic control. During the normal function of the body, heat is generated and some of this is lost via the surface of the skin. When the weather is cold little muscles in the skin crush the cells containing fat (producing the effect known as "goose-flesh") and this is exuded on the surface of the skin whereby evaporation is stopped,

Removing Hair Roots and Other Epidermic Structures.

and the rate of loss of temperature retarded. On the other hand, if due to climatic conditions or mental or

physical excitement the temperature of the body tends to rise, then water is spread over the surface of the skin, in the form of perspiration.

(*g*) During times of plenty, food material is stored in the form of fatty deposits, and these occur largely immediately beneath the skin in the muscular layer referred to in (*c*). Sometimes this fat is not only stored adjacent to the skin, but actually within the skin itself.

(*h*) The skin acts as a colour screen against harmful ultra violet rays. This screen is affected by natural pigments which of necessity occur in large amounts in the skins of the inhabitants of tropical regions.

Briefly, the skins of all members of the animal kingdom could be regarded as consisting of three main layers:

(*a*) Epidermis or outer covering—which consists of the thin outer surface which is constantly wearing away, and also of the structures such as hair, wool, fat glands, sweat glands, &c.

(*b*) Dermis or corium—which alone is used for the manufacture of leather.

(*c*) Adipose—or muscular and fatty layer immediately beneath the skin.

Before the conversion of the skin into leather it is the problem of the tanner to remove from the skin all unnecessary appendages such as the epidermic structures and adipose tissues, and in order to effect this rather complicated work the tanner has to call upon a large variety of biochemical processes in addition to mechanical processes.

Variations in Skins.

From the above it will be seen that the skins of animals will vary both according to their genus and the particular breed, and that the properties of the finished leather will vary according to the area of the skin from which that particular portion of leather has been selected—*e.g.*, the leather obtained from the back and butt of the skin is far less stretchy than portions in the flank, which are called upon to be capable of much stretch and movement during the life of the animal.

By employing different types of tanning materials and different methods of tanning it is possible to vary the properties of leather over a considerable range.

(1) Bark or vegetable tanning materials produce a leather which is, on the whole, firm and plump, rather lacking in stretch, plastic rather than elastic, readily absorbing water and being very sensitive to iron compounds.

(2) Leather dressed by the chamois process is extremely soft and stretchy and lacking in water resistance.

(3) The mineral tannages are mainly represented by:

(*a*) The alum tanning process which is chiefly used for the production of glove leathers owing to the fact that it yields a thin, soft, stretchy leather which is very plastic, and incidentally, not by any means waterproof. The alum salt attacks metal parts with which the leather comes in contact.

(*b*) The aldehyde tannage generally known as "white washable" produces a very soft stretchy leather not sufficiently chemical resistant for industrial purposes.

(*c*) The chrome tannage produces a soft, fairly plump leather having elastic rather than plastic properties. If properly tanned this leather is particularly resistant to water and immune from chemical attack.

Other properties can be obtained upon leathers by judiciously combining different tannages, and in the case of gas meters leathers pre-tannage with vegetable tanning materials followed by re-tannage with chromium compounds yields the desired results.

Oil Dressings.

The diaphragms in gas meters are impregnated with oil dressing, and Mr. Cutbush drew attention to the reasons for this procedure.

(1) Leather itself contains approximately 40% voids; in other words, it is highly porous, and without an oil dressing seal would pass gas quite readily. Fortunately, these voids, or interfibrillar spaces, are represented by a mass of capillary channels and are therefore able to retain oil dressing very efficiently.

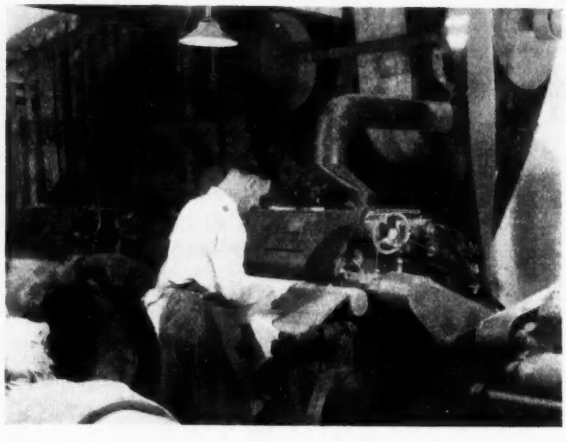
(2) It has been found that soft dry leather can be bent backwards and forwards indefinitely without showing signs of wear and tear, and so the oil is not necessary as a lubricant, neither is graphite used as a lubricant.

(3) The function of an oil dressing thus becomes that of a seal to prevent the penetration of the leather by gas, and to prevent the entry of aqueous compounds which might harden or chemically attack the leather, causing ultimate breaking of the fibres.

(4) If one were to attempt to seal the leathers by using a solid material the effect would be immediately to stiffen the leather, and as it is not possible to make solid films which are as pliable and flexible as the leather itself, the sealing films would break and would also break the leather fibres which were impregnated by it.

The Film.

Next followed the film which opened with a brief review of the conditions under which the diaphragms have to work,



"Shaving" for Level Thickness.

and showed the various types of leather and other materials which have from time to time been tried, culminating in the demonstration of the semi-chrome retanned East India sheepskin diaphragms.

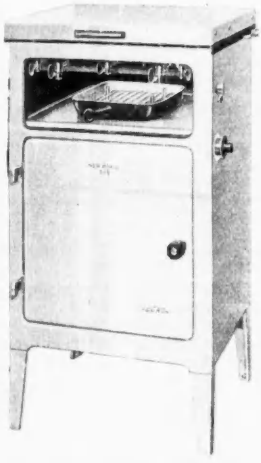
Shots taken in India showed the native shepherds with water bottles of leather on their backs driving their flocks of red-haired sheep to the Madras slaughterhouses, after which the skins from these animals were seen undergoing the various mechanical and chemical processes by which the hair and other epidermic structures are removed, the adipose and muscular tissues removed, and the prepared skins subsequently tanned by vegetable tanning materials, and the leather graded and baled ready for shipment to the London sales.

In contrast the mechanized processes of leather manufacture in England were shown, together with visits to the works laboratory where the chemical control of the various stages of the chrome re-tanning is carried out.

In a series of close-ups the highly skilled process of cutting precision diaphragms was seen, together with the battery of tests through which the diaphragms passed before being stamped with a series of references from which the complete history of any diaphragm can be ascertained after years of service in a gas meter.

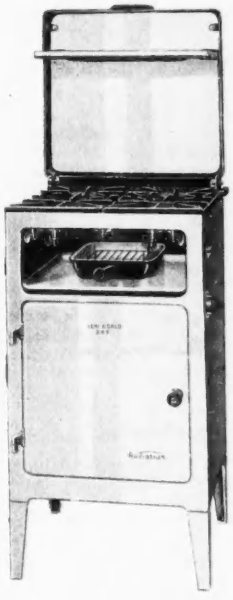
A New Cooker by Radiation Ltd.

Radiation Ltd. have brought out a new domestic cabinet cooker —No. 345 "New World"—embodying many advances in technique. It is being shown at the British Industries Fair at Castle Bromwich and is attracting much attention. This all-enamelled cooker has a hinged cover top incorporating a solid folding shelf which is kept rigidly in position when erected. The oven door is recessed flat into the front frame, and, by the omission of the usual cornices, the appearance of the hotplate is greatly improved. The top plates are shaped to overhang at the front and are finished in black vitreous enamel. Four boiling burners and grill are accommodated without any overcrowding.



The No. 345 "New World," Closed Position.

There are two Duplex burners, and the usefulness of the cut-down flame is enhanced by the design to ensure the stability of small pans over the burner. The grill, which is fitted with special frets, is designed for speedy operation, and, thanks to the ample accommodation under the hotplate, grilling operations can be carried out comfortably. Self-lighting hotplate burners are provided, these being ignited by merely turning on the taps. A gas taper, lighted from the hotplate burners, enables the oven burner to be easily ignited at the front lighting point. The taps of the hotplate burners are heat insulated and are positioned so as to avoid accidental turning-on. The consumptions of the hotplate burners are as follows:



The No. 345 "New World" Ready for Use.

One high-power ring burner, 26 cu.ft. per hour.
One Simplex burner, 18 cu.ft. per hour.
Two Duplex burners for general work, 26 cu.ft. per hour.
High-speed grill, 26 cu.ft. per hour.

All these burners are of the non-lighting-back type, maintaining stability in use.

An advantage, particularly in respect of light entering the oven, is the fact that the door swings well back when opened. The oven interior is finished in a hard grey enamel, and the grid runners are embossed on the sides. As with all "New World" cookers there is one oven burner only, positioned at the back. By means of a flash ignition tube, the burner, as already mentioned, is very easily lighted at the frontal lighting point. Ease of cleaning is an important point about this new cooker—a feature which will appeal to the housewife. Angles and crevices have been eliminated as far as possible, and corners have been rounded. The outcome has been to reduce the operation of cleaning in a marked degree. From the gas undertaking's point of view, there will be lively satisfaction with the ease of maintenance and fitting.

Though the new cooker is streamlined and all supply pipes are concealed, all parts are readily accessible. Fixed orifice injectors of size depending on the calorific value of the gas are fitted, and these greatly simplify pressure and burner adjustment. Removal of the flash tubes for cleaning presents no difficulty and the tubes are so aligned that they cannot be incorrectly replaced.

A feature of great interest is the new type of "Regulo" oven heat thermostat fitted to the No. 345 "New World." This new "Regulo," the result of much experimental work, can be removed and cleaned without in any way disturbing the calibration —a fact which will be appreciated by gas undertakings.

Oven linings and other components of the cooker are easily and quickly replaced. The cooker is built on a cast iron frame and the oven is treble cased. The outside panels can be removed quickly, admitting of access to the "Regulo" and connexions, while the inside and middle linings can be removed together as a single packed slab, and as easily replaced. To allow for any unevenness of the floor there is a levelling screw on the back right-hand leg of the cooker. The enamel is applied by a new process which ensures hard-wearing and proof against shock. The new cooker is available in white enamel and also in two colour finishes, pastel green and pastel blue.

The New Pattern "Regulo."

A model similar in design to the No. 345, but 2½ in. wider, is being marketed under the designation No. 348 "New World." The two principal top castings are as in No. 345, and in addition there is a third central plate. The hotplate burner complement is as on No. 345, with increased side-to-side spacing. The door opening of the oven is 16 in. high by 18 in. wide, the depth, as in the No. 345, being 14 in.

All the recipes given in the Radiation Cookery Book can be carried out in these new ovens without any modification of the instructions given.

Manchester and District Juniors

Visit to Staveley Works

An interesting visit was paid by members of the Manchester and District Junior Gas Association on Feb. 1 to the Works of the Staveley Coal and Iron Company, Ltd., near Chesterfield. The journey was made by road along snow-covered country, and despite the demands made by the public on Mr. Therm, due to cold weather, over 100 members were able to take part in the visit.

Arriving at the Works shortly after noon, parties were formed to inspect the coke oven plant, blast furnaces, cintre plant, and by-products plant. During the inspection of the laboratories, Mr. J. B. Allen (Foundries General Manager) gave a talk on the structure of iron, and, assisted by micro-photographs, explained changes that took place during the various processes of pipe-making.

The members were entertained at luncheon at Ringwood Hall, which is used as a social club. After lunch, Mr. H. H. Berresford (Director and Commercial Manager) welcomed the party and went on to say that there should be greater co-operation between the coal industry and the Gas Industry, for they were closely related. The Gas Industry was based on coal and his Company turned out 1/24 of the total coal output of Great Britain. During the morning he had already discussed this important subject with Mr. Dixon and Mr. Holton, and it was pleasing to note that the two industries were now co-operating in selling organizations. It was over thirty years since the Manchester Juniors last visited their Works but he hoped that such a long interval would not elapse before their next visit.

Mr. G. Dixon (Senior Vice-President of The Institution of Gas Engineers) observed that he was still a member of the Manchester Juniors and that he was proud of his membership. It was essential, from a national and economic point of view, that the two industries should get very much closer together, particularly on the commercial side, for they both had the same by-products, and it was essential that the resources of both should be utilized to the greatest possible advantage. There was a definite desire on the part of both industries to get closer together. There were difficulties in the way, but they were not insurmountable. There

was no better way of surmounting such difficulties as such occasions at the present visit. It was a very much better way than conference tables and long letters. He had very happy recollections of his long association with the Manchester Juniors, for he became a member 30 years ago.

During the afternoon the members were conducted over the vertical-cast and spun pipe foundries. The sand-spun plant has a capacity of 60,000 tons of pipe per annum ranging from 4 in. to 24 in. in diameter. The metal-spun plant is of smaller capacity, the sizes of the pipes being limited from 2 in. to 6 in. diameter. Great interest was shown in the heat-treatment process which is essential in metal-spun processes, and the foolproof system in operation for controlling the heats in the furnace attracted much attention. (A more detailed account of the pipe-spinning process will be found in the "JOURNAL" for Oct. 21, 1936, pp. 222-223.)

The special castings foundries and the machine shops were also inspected, and great interest was shown in the three 5,000 kW alternators each driven by 7,120 h.p. gas engines.

After tea the PRESIDENT (Mr. H. Platt, of Bolton) thanked the Directors for the kindly and hospitable way in which the members had been received, and the vote of thanks was seconded by Mr. T. V. BLAKE (Blackpool).

Mr. J. B. ALLEN and Mr. T. A. MCKENNA (Assistant Commercial Manager) responded.

TRADE NEWS

A Handsome Publication.

We have received from Turner's Asbestos Cement Company (Branch of Turner & Newall, Ltd.) an extremely handsome book describing their new works at Dalmuir. This pioneer firm of asbestos-cement manufacturers informs us that the object behind the establishment of the asbestos-cement industry in Scotland is two-fold. First it is to ensure quicker deliveries of Turner's asbestos-cement products to all parts of Scotland and to make possible an extension of the service now enjoyed by users in other parts of the country. Secondly, these new works will find new outlets for Scottish labour and form another link with the chain which already includes Trafford Park (Manchester), Widnes (Lancashire), Erith (Kent), and Rhoose (Glamorganshire). The well-produced publication referred to shows how on a derelict site by the Clyde at Dalmuir a thriving industry has been established and is now in full production.

Comprehensive Fire Protection.

The foreword of an excellent booklet, "Industrial Safety," published by the National Fire Protection Company, Ltd., Petersham Road, Richmond, is respectfully dedicated to the "expert fire engineer, who is ready to discard prejudice in favour of personal investigation; to the manager, who, with but a limited knowledge of fire protection, desires to obtain honest advice from a reputable company; and to all who value the safety from fire of premises and employees." Each year of peace, the foreword continues, sees some £12,000,000 of actual, as distinct from consequential, damage by fire in Great Britain alone. In the main, the loss is avoidable by the application of modern fire prevention, detection, and extinction methods, not only when constructing new property but by the courageous replacement of unsuitable, worn-out, or obsolete, and, therefore, dangerous, equipment.

That the theme of the booklet is the excellence of methyl bromide for the protection of a wide range of hazards must not be taken as a recommendation for the use of this medium as the best answer to all fire protection problems. Water, properly applied, is cheapest and best for some 85% of outbreaks, and the equipment necessary, together with a large selection of other apparatus is dealt with in "National Safety" (General Protection, including A.R.P. items), "Cruising with Safety" (Marine Protection), "Essex for Safety" (Protection of Aircraft and Aerodromes), and other publications of the Company.

"Visco" Cooling Units.

A well-produced catalogue (No. 393) published by Visco Engineering Company, Ltd., of Stafford Road, Croydon, describes and illustrates the firm's "Forcedraught" water coolers which are suitable for a variety of purposes. These small units are useful for diesel engines, air compressors, water-cooled transformers, degreasing plants, and electric resistance welders—in fact, wherever small or medium volumes of cold water are needed for heat extraction. The water is re-cooled and used over and over again.

The cooler has a substantial welded steel shell, the base of which forms the cold water tank. For very small duties the cooler shell is made in one piece and completely assembled. For medium capacities the casing is made in sections, and where narrow doorways or staircases have to be negotiated, a panel formation is adopted. In all cases, the erection is exceedingly simple, and no foundations are required beyond a flat solid base.

The draught fan is usually direct motor driven, the motor being totally enclosed, weatherproof, and, of course, suitably guarded. Where desired, Vee rope—either from a separate motor or from the pump motor—can be arranged. Separate motors for fan and pump are definitely preferable as the cooler and pump need not be placed close together in distinct relation to each other, as this often complicates the arrangement. After removing the eliminator plates, the complete interior fittings can be removed without any difficulty in a very short time and re-assembled by unskilled labour.

To be able to locate these compact cooling units near the engine or other plant makes for simplicity and inexpensive piping and, at the same time, convenient control over the whole installation. The unit is independent of natural air currents and occupies so little space that many an odd corner quite useless for a natural draught cooler can be utilized.

Ewart's Hot-Water News

This is the title of a well set-out little broadsheet published by Ewart & Son, Ltd., of 346-350, Euston Road, N.W. 1, to draw attention to some of the interesting gas water heating appliances which the firm will be showing on their stand at the Birmingham section of the British Industries Fair. Prominence is given to the "Empire" multi-point heater, with full specifications and an illustration showing method of fixing. Other appliances featured are the "Utilis" multi-point heater and the No. 25 single-point bath heater, together with the well-known "Califont."

Basol, Ltd.

We learn from Grosvenor Utilities, Ltd., that part of their Company which deals with the sale of Basol products will be handled by their associate company, Basol, Ltd., of the same address as themselves, Terminal House, 52, Grosvenor Gardens, S.W. 1.

"Meehanite."

In 1933, Messrs. Ashmore, Benson, Pease, & Co., Ltd., realizing the great need for a superior high duty cast iron for practically every class of the engineering industry, pioneered the manufacture of "Meehanite" in this country. Since that year the output of "Meehanite" metal castings has shown a consistent increase, vindicating the policy of the Company and definitely indicating the growing popularity of "Meehanite."

The qualities claimed for this high duty cast iron include high tensile (up to 25 tons per sq.in. in the "as cast" condition), dense structure, wear and heat resisting, hardening and tempering without carburization, and resistance to both corrosion and erosion.

"Fitness."

"Fitness" is the title of a very attractive folder recently published by Messrs. Head, Wrightson, & Co., Ltd. This illustrates the Thornaby-on-Tees municipal swimming baths, designed, manufactured, and erected by the firm. Claiming to be pioneers in welded constructions, Messrs. Head, Wrightson will be pleased to design baths, pavilions, gymnasia, &c., under the National Fitness Scheme, or, if closer collaboration is desired, will arrange a discussion with a specialist.

A Bulletin for Builders.

An excellent publicity and propaganda move has been made by Electrolux, Ltd. This is the publication of Builders' Bulletins, and very effective these Bulletins are. The firm is mailing them direct to builders and architects who have been interested by gas undertakings in Electrolux gas refrigeration and are also being used by gas undertaking salesmen dealing with builders and architects. The Bulletins are exceedingly attractive and give an idea of the extent to which gas refrigeration has been and is being developed. They should prove of great help to the Gas Industry and a real incentive to architects and builders to include gas refrigerators in all new houses as standard equipment. Incidentally, a handsome and convenient folder on the loose-leaf principle is available for filing the Bulletins.

Gas Undertakings' Results

Altrincham.

The profit shown by the Revenue Account of the Altrincham Gas Company for the year 1938 is £10,029, which compares with £15,763 for 1937. The quantity of gas sold in the past twelve months was 2,473,620 therms, as against 2,500,974 therms in the previous year. Coal has, however, cost £4,000 more, while receipts from coke and breeze have been nearly £3,000 less. After making a transfer of £2,000 from the Reserve Fund Account, the balance shown by the Profit and Loss Account as available for dividend is £5,619, which will provide the full statutory dividends, and leave a balance of £1,180 to be carried forward to the next accounts.

Barnet.

The Directors of the Barnet District Gas and Water Company, in their report for the past year, express regret that the heavy increase in the cost of coal, labour, and materials generally will necessitate an increase in the price of gas as from the March quarter. The total quantity of gas sold in 1938 was 2,652,353 therms, which compares with 2,659,265 therms in the preceding year. The balance on Gas Revenue Account carried to Profit and Loss Account on the present occasion is £21,452, as against £24,155 a year ago. The payment of the authorized dividend at the rate of 7% per annum on the ordinary stock will leave to be carried forward the sum of £52,094. During the year the Company issued £50,000 of 4½% preference stock, at an average price of £111 1s. 7d. per £100 of stock.

Cardiff.

That there is to be a further extension of the activities of the Cardiff Gas Light and Coke Company is shown by the announcement that the Directors have made application to the Board of Trade for a Special Order to enable them to supply gas in the parishes of Marshfield, Peterstone, and so much of the parish of Michaelstone-y-Vedw as is not within the limits of the Newport (Mon.) Gas Company. The report of the Directors for the past year recommends the payment of a dividend upon the consolidated ordinary stock at the rate of 6% per annum. The Capital Account includes an expenditure during the twelve months on new mains of £10,046, and on new meters of £4,612, with the result that the account is now in debit to the small extent of £6,325. The gas sold to private consumers totalled 7,854,342 therms, which compares with 7,808,709 therms in 1937. The receipts for gas used for public lighting and under contracts were £130 down on the year. While coal cost some £6,000 more, coke realized very nearly the same amount less.

Cheltenham.

At the annual meeting of shareholders in the Cheltenham and District Gas Company the Directors will report that the payment of the dividend for the year on the 5% consolidated ordinary stock will leave a balance to be carried forward of £13,445, which is about £300 more than the sum that was brought in. The total quantity of gas sold was 713,510,400 cu.ft., as compared with 715,854,100 cu.ft. in 1937. The price of gas has remained the same throughout the year. At Dec. 31 the consumers numbered 26,224—9,334 ordinary and 16,890 prepayment. The Directors record with regret the death, which occurred last July, of Mr. Lionel E. Twycross, after upwards of 40 years' service in the Company, during the last 15 of which he had been the Company's Engineer and Works Manager.

East Wight.

The East Wight Gas Company, whose headquarters are at Shanklin, are paying 8% for the past year on the ordinary stock. This, the Directors point out, was the first complete year's working of the combined undertakings of the Shanklin and Ventnor Gas Company and the Sandown Gas and Coke Company, Ltd. The quantity of gas sold during the twelve months was 799,698 therms. The sales shown in the accounts for the previous year (which embraced nine months of the Shanklin and Ventnor Gas Company and three months of the East Wight Gas Company) were 625,036 therms. Some addition to the expenditure on Capital Account during the year has placed it in debit to the extent of £3,605.

Gloucester.

The Directors of the Gloucester Gas Light Company recommend a dividend for the past year of 5½%, which will leave a balance to be carried forward of £14,047. The quantity of gas sold during the year was 2,811,405 therms, as compared with 2,841,733 therms in 1937. The total number of consumers at December last was 18,750, of whom 11,112 were ordinary and 7,638 prepayment. The balance of revenue carried to Profit and Loss Account on the present occasion is £19,426, as against £20,192 a year ago. Transactions on Capital Account during the year have left it in debit by the small amount of £8,523.

Hartlepool.

The Directors of the Hartlepool Gas and Water Company, in their report for the year 1938 state that the total sum available for distribution is £37,573. The payment of a dividend of 3% for the year will leave a balance of £21,562 to carry forward to the next accounts. For the previous year the dividend was at the rate of 5% per annum, and the balance carried forward £22,893. Substantial increases have had to be met in expenditure on Gas Revenue Account. Manufacturing costs are up nearly £10,000, and rates and taxes more than £2,000. On the other hand, receipts from gas and rentals total about the same as a year ago, while residual products account for almost £2,000 less. Public lighting has brought in a little more, but the quantity of gas sold by meter decreased from 2,249,098 therms to 2,107,322 therms. There is a balance at debit of Capital Account of £50,506.

Maidstone.

It is reported by the Directors of the Maidstone Gas Company that after the payment of a dividend of 9% on the 5% capital stock for the year 1938, there will be a balance of £6,380 to be carried forward to the credit of the current year. The carry-forward a year ago, after setting aside £1,000 for the Reserve Fund, was £6,719. An expenditure during the year of over £2,000 on new mains and new meters (not in place of old ones) leaves the Capital Account in credit to the extent of £9,661. On Revenue Account, expenditure has been about £1,000 higher than a year ago, and receipts £2,000 less, with the result that the balance carried to Profit and Loss Account is £18,471, as against £21,327 a year ago. The total quantity of gas sold in 1938 was 2,362,038 therms; in 1937 it was 2,441,947 therms.

Newmarket.

During the year 1938 the Newmarket Gas Company earned a profit of £4,264, out of which the Directors recommend the payment of a dividend at the rate of 8½% upon the original consolidated stock, which will leave a balance to be carried forward of £11,419—practically the same as the sum brought in. There was no expenditure on Capital Account during the year. Coal, including carriage, &c., cost about £450 more, without a corresponding increase in gas sales receipts or returns from coke. "Bad debts" remain a remarkably small item in the accounts, though it is true that on this occasion they have doubled themselves, to £1 8s. 8d.

Perth, W.A.

The annual report of the City of Perth (Western Australia) Gas Department reveals good working results for the twelve months to Sept. 30 last, the quantity of gas manufactured showing an increase, as compared with the previous year, of 6·69%, and the amount sold an increase of 7·08%, at 408,260,535 cu.ft. The number of meters in use increased by 1,363 during the year, to 24,662. Extensions have been carried out in several districts, and the area of supply has been increased. It is pointed out that in the current year the Gas and Electricity Department will be faced with increasing costs over which it has no control—a 5s. increase in the basic wage, recent arbitration awards, National Insurance, and extra costs due to the coal strike.

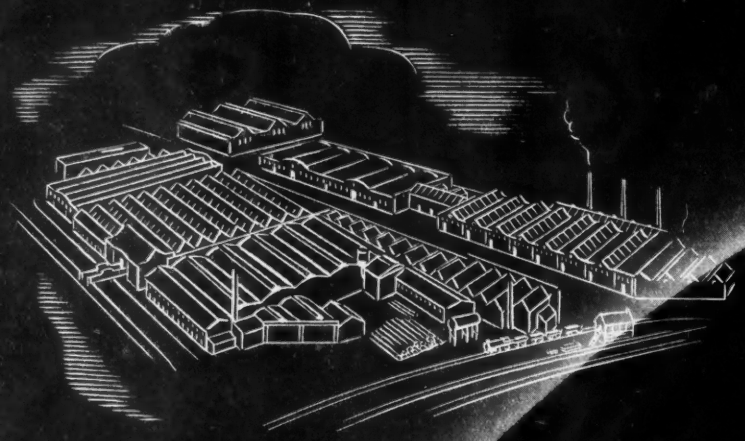
Portsmouth and Gosport.

In spite of the unusually mild weather during the greater part of the past year, the Directors of the Portsmouth and Gosport Gas Company were in a position to report at the annual meeting (an account of which appears on another page of the "JOURNAL") that there has been a satisfactory increase in the demand for gas, while gratifying expansion is also shown in the number of cooking and heating appliances in use. Owing to substantial advances in the cost of production and distribution, the price of gas throughout the Company's area of supply was increased by 0·6d. per therm from Oct. 1 last. It is pointed out, however, that the price to ordinary consumers within the City of Portsmouth is still as low as 7·6d. per therm. Dividends for the year of 5% on the 5% maximum stock and of 8½% on the consolidated stock will leave a carry-forward of £43,910.

Reading.

Dividends at the statutory rates for the past year are being paid on the 5%, 5½%, and 6% ordinary stocks of the Reading Gas Company. During the year Special Orders were made by the Board of Trade providing for an alteration in the number of Directors, and authorizing the Company to store gas on land acquired at Tilehurst. The loan capital has been increased by the issue at par of £15,000 of 3½% redeemable debenture stock. The Revenue Account shows the quantity of gas sold to have been 1,390,708,800 cu.ft., as compared with 1,448,601,500 cu.ft. in 1937. The Directors report a large increase in the sale of gas apparatus. Receipts and expenditure on Revenue Account both

LEADER

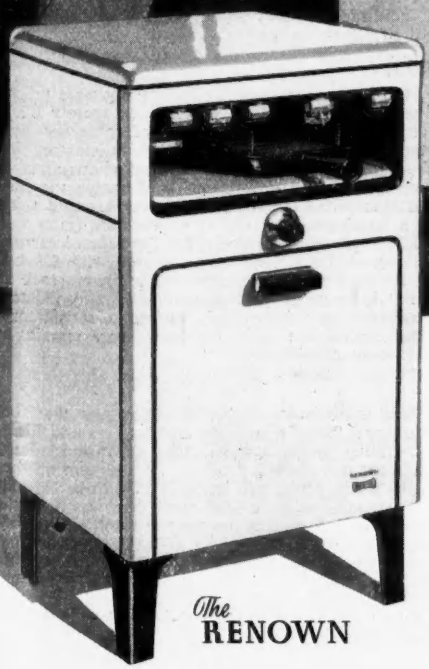


THE Parkinson Organisation has been built up to its present proportions on the foundation of a continuous policy of progress and service, with quality as its password. Year after year, the design of Parkinson Gas Appliances has kept pace with modern times, and leadership in design has been achieved. The transformation of the gas cooker to harmonise with the modern kitchen interior was pioneered by the Parkinson Organisation with the introduction of the "RENOWN."

The CROWN

B ★ I ★ F 1939 Stand No. C.a500 (Gas Section)

ER S H I P ★★★



The **RENOWN**

Contemporary designs have since been introduced, yet the combination of beauty, strong construction and perfect cooking performance has maintained the "RENOWN" in its dominant appeal to the housewife. Standardisation in design to meet all domestic cooking demands has been achieved by the addition of the "CROWN" series. These modern cookers, and a representative selection of Parkinson Gas Fires, Radiators, and Water Heaters will be exhibited on the Stand Ca500, to visit which a cordial invitation is extended.

PARKINSON

The PARKINSON STOVE Co. Ltd. BIRMINGHAM 9

show some increase, with the result that the balance carried to Profit and Loss Account is £40,796, as against £41,997 a year ago. The balance of net profit to be carried to next account, subject to the half-year's dividends to December, is some £200 up, at £58,172.

Romford.

In their report for the year 1938, the Directors of the Romford Gas Company state that the sale of gas exceeded that of the previous year by nearly 50 million cu.ft., or 5·87%. Over the twelve months, 2,950 additional consumers were connected to the Company's mains, and 4,384 appliances were fixed on consumers' premises. Such gains are particularly gratifying when it is borne in mind that in 1937 the increased quantity of gas sold was 7·24%, with corresponding additions to the numbers of consumers and of appliances installed. During the past year further capital has been raised by the issue of £100,000 of 4% redeemable preference stock and £30,930 of 4% irredeemable debenture stock. New showrooms have been opened, and a 2½ million cu.ft. gasholder has been put into commission. In terms of the Company's Act, the sum of £5,005 10s. has been applied out of the profits of the year for the benefit of the employees. The payment of the dividend of 8% per annum on the ordinary stock will leave £4,564 to be carried forward. The amount carried forward a year ago was £7,627. During the past year over £100,000 was spent on capital account, and the debit on Dec. 31 was £116,242. The total quantity of gas sold in 1938 was 891,945,900 cu.ft. Mr. John Grayston and Mr. Arthur R. Shirley having been appointed to the respective positions of Engineer and Secretary to the Company, Mr. John Compson Wright and Mr. George Berridge will continue to act in the capacity of Joint Managing Directors.

Scarborough.

The sale of gas at Scarborough during the past twelve months totalled 2,964,111 therms, which was an increase of 16,363 therms, or 0·55%, over the sales of the previous year. The Directors of the Gas Company point out in their report that the price of gas during the whole of the year has been less than the basic rate of 9·2d. per therm. Therefore, in accordance with the Company's Act, the Directors recommend again that the dividend for the twelve months on the ordinary stocks be increased from 5% to 6%, and that the sum of £1,181 be placed to the Profit-Sharing Scheme. After providing for the final dividend, &c., there will remain a small balance to carry forward. During the year the Company issued the whole of the £28,507 of unissued capital (including premiums) as 4½% redeemable preference stock. A net increase of some £15,000 to the expenditure during the year has put the Capital Account in debit by £16,456, after allowing for the additional redeemable preference stock. The balance on Revenue Account carried to profit and loss on this occasion is £26,376, as compared with £29,214 a year ago. Public lighting accounts for 329,772 therms, against 323,705 therms in 1937.

South Staffordshire Mond.

The gas distributed by the South Staffordshire Mond Gas Company during 1938 was 15% less than in 1937. The amount of fuel gasified during the year was 17% less than in the preceding twelve months, while the cost of this fuel was 7% less. The net profit for the year is £10,601, and with the amount brought forward there is an available balance of £33,282, out of which the Directors recommend the payment of a dividend of 1½% on the ordinary shares. The amount received for gas sold in 1938 was £115,826.

Southampton.

The Directors' report and statement of accounts for 1938, to be presented at to-day's meeting of shareholders in the Southampton Gas Light and Coke Company, an account of which will appear in the "JOURNAL" in due course, reveal a gratifying increase in sales of gas for the year of 95,068,200 cu.ft., equivalent to 436,136 therms, or 4·51%. There has also been a satisfactory increase in sales of gas appliances. New offices are in course of erection, as well as the re-modelling of the showrooms; while the new carbonizing plant at the Southampton Works is nearing completion. The Directors recommend a dividend for the year on the ordinary stock of 5¼%.

Sunderland.

The Net Revenue Account of the Sunderland Gas Company for the past year shows that, after deducting the interim dividend, there is an available balance of £26,152, out of which the Directors recommend the payment of a final dividend of 3%, making 6% for the year. This will leave the sum of £16,181 to be carried forward, as compared with £15,535 a year ago. The quantity of gas sold during 1938 was 6,703,395 therms, as compared with 6,784,040 therms in 1937. Of the total, 3,966,945 therms of gas were purchased. Some small additions to expenditure during the year brought the debit balance on Capital Account to £49,964, against which there is a sum due to bankers of £43,565.

Watford and St. Albans.

An increase of 1·67% in sales of gas is reported by the Directors of the Watford and St. Albans Gas Company for the year 1938. The actual quantity sold was 1,792 million cu.ft. The biggest day's output was something over 9 million cu.ft. on Dec. 20—a record in the history of the Company. A year ago the Directors were able to report an increase of 4·2% over the gas sales for 1936. An agreement has been entered into with the Chesham and District Gas Company whereby they will be supplied with the whole of their gas requirements. Owing to the continued increase in the price of coal and materials, the Directors had to increase the price of gas to quarterly consumers from 9d. to 9·6d. per therm as from the first meter readings after June 30 last. Nearly £200,000 has been added to capital expenditure during the year. The Revenue Account shows a profit of £94,747, which compares with £92,330 a year ago, when £2,000 was placed to the Special Purposes Fund. The dividend recommended on the ordinary stock makes £6 17s. 6d.% for the past year.

Weston-super-Mare.

The Directors of the Weston-super-Mare and District Gas Company, in their report for the past year, state that the sales of gas show a decrease of 1·87%, when compared with the figures for the previous year—a decrease which is sufficiently accounted for by the exceptionally mild weather experienced during the spring and autumn periods of the year. The actual sales in 1938 totalled 2,440,380 therms, or 513,764,000 cu.ft. Manufacturing costs came out at about £350 more, a saving of £5,000 in cost of coal and oil delivered on works being more than offset by the charge for repairs and maintenance of works and plant, including renewal of retorts, which is about £7,000 up. It is, however, pointed out in the report that this expenditure on repairs and maintenance includes items for the removal of a gasholder from the Highbridge to the Weston Works, and also for repairs to two gasholders at the Burnham Works. This special expenditure amounted to a total of £5,689. The Directors recommend the payment of a dividend of 5% on the consolidated ordinary 5% maximum stock.

Whitby.

The quantity of gas sold to private consumers by the Whitby Gas Company during 1938 was 275,642 therms, which compares with 266,487 therms in 1937; but the receipts for "Calor Gas" have come down from £63 to £2 8s. 4d. The balance of revenue carried to Profit and Loss Account is £3,986, against £2,779 a year ago. There remains a balance at credit of Capital Account of £5,663, after the expenditure during the year of some £12,000 (£1,269 of which was in connexion with a new benzole plant). The dividends for the year are 6½% on the original capital and £4 11s.% on the additional and new additional capital, which will leave a balance of £1,318 to be carried forward.

Wolverhampton.

Sales of gas by the Wolverhampton Gas Company were practically maintained at the 1937 level—a decrease of merely 0·3% being recorded for the past year. The number of consumers and the sale of all types of appliances again show satisfactory increases. The rebuilding of the town offices and showrooms is being proceeded with. The quantity of gas sold during the past year was 5,579,737 therms. Receipts on Revenue Account were somewhat up, but a larger rise is shown in expenditure (rates and taxes are nearly £1,300 up), with the result that the balance carried to Profit and Loss Account is £24,839, as compared with £29,495 a year ago. The dividend on the consolidated ordinary stock is 7% per annum. An issue of £60,000 of additional consolidated ordinary stock was made last June, and realized a satisfactory premium. With the expenditure during the year, there remains a debit on Capital Account of £90,680.

Yorktown.

The Directors state in their report for the past year that the business of the Yorktown (Camberley) and District Gas and Electricity Company continues to show satisfactory expansion. They recommend the payment of a dividend of 6½% per annum on the consolidated ordinary stock, which will leave £11,530 to be carried forward to the next accounts, or some £200 more than was brought in. There has been received during the year from the issue of 4% redeemable preference stock the sum of £60,000, which leaves a debit balance on Capital Account of £44,874. The balance of gas revenue carried to Profit and Loss Account is £21,369, as compared with £18,890 a year ago. The total quantity of gas sold during the past year was 1,452,327 therms; for 1937 the amount was 1,440,198 therms.

COMPANY MEETINGS

The Wandsworth and District Gas Company

The Annual Ordinary General Meeting of the Company was held at the Chief Office, Fairfield Street, Wandsworth, London, S.W., on Tuesday afternoon, Feb. 14, 1939—Mr. FRANK H. JONES, M.Inst.C.E., the Chairman and Managing Director, presiding.

The SECRETARY (Mr. G. S. P. G. Hoare, B.A.) having read the notice convening the meeting and the Auditors' Report, it was agreed to take as read the Directors' report and statement of accounts for the year ended Dec. 31, 1938.

ADDRESS OF THE CHAIRMAN.

The CHAIRMAN: Ladies and Gentlemen,—I am sorry to say that Dr. T. A. I. Howell, the Deputy-Chairman, has been unwell, and is not with us to-day. You will all be glad, however, to know that he is getting better.

Issue of Capital.

During the year under review, and under powers of the Act of 1937, the sum of £400,000 of 3½% Redeemable Debenture Stock was issued at a premium of 10s.%. This issue was made free of expense to the Company, and I think you will agree reflects confidence of investors in the Gas Industry in general, and in this Company in particular.

Capital Expenditure.

During the year £236,000 has been expended on Capital Account, but £85,000 has been written off in respect of depreciation, &c.; the net figure being £151,000, which compares with £149,500 for last year. The capital expenditure is, perhaps, rather greater than usual, but, as you will hear later in my remarks, there has been considerable extension in the manufacturing and purification plant of the Company, particularly at the Wandsworth Works, whilst the normal expenditure on mains, meters, and stoves to meet the requirements of new consumers has been maintained.

Revenue Account.

This Account must, I think, be considered satisfactory, and it appears only necessary to say that the whole of the expenditure is normal, and compares reasonably with previous years. The receipts from coke are satisfactory, and the market throughout the year has stood at the high level reached in 1937; but I would point out that the coke sold to-day is a different commodity from that of some years ago. Expensive plants have been provided for the cleaning, cutting, and grading of coke, and the present price in part reflects the return on this capital expenditure and the by no means inconsiderable expense which has been incurred in the development of the domestic market. These plants have enabled our Company to cater for, and maintain, the best type of this trade.

Coal.

During the year under review we have received coal under old and unexpired contracts to a large extent, but I would point out that we must provide for considerably increased costs when these contracts expire and the new ones come into force. I would, however, say that the new contracts have been negotiated on favourable terms, bearing in mind all the present conditions.

General Manufacture and Distribution.

The general manufacturing and distribution costs still show a tendency to increase, but, on the other hand, the sales of appliances have been well maintained—particularly bearing in mind the prevailing depressed state of trade.

Bad Debts.

Last year I had to refer to the somewhat high amount appearing under the heading of "Bad Debts," but I then reported that this was exceptional, and likely to be reduced considerably in the near future. The figure in the 1938 accounts is only a little more than half that of the preceding year, and includes amounts written off in respect of irrecoverable hire-purchase bad debts.

Another item which should be mentioned is the expenditure which has had to be met during the year in connection with Air Raid Precautions, the cost of which has been charged to revenue.

Investments.

Turning to the Balance-Sheet, I should like to point out, what I am sure will meet with the approbation of the proprietors, the fact that our Reserve Fund, Special Purposes Fund, and Insurance Funds, amounting as they do to nearly £175,000, are invested in securities which on the 31st December last showed a market value in excess of the figures at which they appear. It has been our established practice for many years to invest these funds outside the business of the Company.

The Revenue Account throughout has, of course, been computed by sound methods, and the charges arrived at on a conservative basis of accountancy. You will notice that at the present time, owing to the issue of capital, there is no loan from the bankers. The Hire-Purchase Account appearing on the "assets side" of the Balance-Sheet does not show a figure very much in excess of the previous year, but, in actual fact, the total amount due to the Company in respect of these sales, constitutes a new hire record. I am pleased to say that the reserves which we hold against this total represent a higher ratio than in any previous year.

Increase in the Price of Gas.

It is a matter of regret that the Directors have to report that a further increase in the price of gas to the extent of 0·4d. per therm will have to be made as from the meter readings after the 1st April next. The proprietors will realize, I hope, that this increase is caused by circumstances entirely without the control of the Directors, and are of such a general nature that not only has the Gas Industry had to increase its prices, but also the Railway and Transport Companies, and, to a large extent, other Public Utility Undertakings. This further increase has been found necessary after every effort has been made by all means available within the Company's organization to economize in the manufacture and distribution of gas.

It is further regretted that this unavoidable increase in price carries, not only the disadvantage that our commodity will cost more to our consumers, but will almost certainly entail a reduction of one-half per cent. in the statutory dividends to the proprietors; and, also, the Co-partners will most probably have their bonus reduced by approximately 25% next year.

Sale of Gas.

The sale of gas shows a slight decrease in the amount sold to consumers—namely, 0·34%. Actually, the gas manufactured shows a fractional increase, and it should be noted that the Company is a large consumer of gas in the manufacture of residual products—particularly those of benzole and toluole, which provide a contribution to the Revenue Account, and necessitate the gas being manufactured in the ordinary way before such processes can be commenced.

Another point that should be borne in mind is that it can be said without the slightest doubt that gas is used more extensively, and for a larger number of purposes, than ever before, but, owing to the increasing economy of modern apparatus, the use of gas per consumer has not shown a parallel increase in the total quantity consumed. In addition, the proprietors will doubtless be interested to know that the sale of gas, owing to the large extent to which the public rely upon it for domestic heating, bears a close relationship to the prevailing weather, and the average temperature during the year under review was considerably above the normal. As a matter of interest, it can be said that, since the beginning of this year, with colder conditions, a considerable increase in the amount of gas sold is recorded. Again, and to emphasize this point, there will still be fresh in your minds the intensely cold, but short, period which occurred just before last Christmas. During those few days the Company sold more gas than ever before in the history of the undertaking, and, in fact, on three consecutive days reached a new record of 20% over our previous best.

New Consumers.

During the year, as will be seen from the circulated accounts, the number of consumers increased by 6,141, which now brings

our total number to approximately 210,000; and I am glad to report that, in spite of the fact that there was a considerable trade depression during the latter part of last year, the sales of apparatus to our consumers were maintained at a high level. The total number of major appliances sold for cash and on hire-purchase was 31,437, of which cookers accounted for 8,500 and hot-water appliances totalled 17,500. The latter is a load which the proprietors will appreciate is sound. It is one which is being cultivated by the selling staff of the Company, and has a large and promising future. As I pointed out last year, the sales of major appliances throughout the showrooms amount to nearly 100 pieces of gas-burning appliances per working day throughout the year.

Showrooms.

The Company now has twenty showrooms, and I am sure those of the proprietors who have seen or inspected these premises will agree that we have some of the best equipped and most attractive showrooms in the Industry. It will always be, as in the past, the policy of your Directors to maintain your showrooms at a high state of efficiency and provide for the public the best facilities possible.

During the year the showroom at Tooting and that at Byfleet have been entirely reconstructed and enlarged, and, in consequence, are attracting greater trade than before, which confirms the opinion of your Directors that, the more modern the showroom and the greater the facilities given, the more the consumers appreciate the advantage of the Company's services. Beyond the reconstruction of these two showrooms, a new showroom has been opened in London Road, Morden. These premises are not only large, but very attractive, and are doing good trade in a district which is growing rapidly. A site for a further new showroom has been secured in New Zealand Avenue, Walton-on-Thames. The work of construction is now in hand, and the premises are expected to be opened to the public shortly.

I think it will be interesting for you to know that over 605,000 persons called at our showrooms during the year, which proves conclusively that they are not only of a high commercial value, but are of considerable use in catering for the requirements of our consumers, which should be the ideal of a progressive Company such as ours.

Gas for Industrial Purposes, Central Heating, and Hospitals.

Your Company has a large and well-organized Department specializing in the use of gas for central heating, industrial purposes, and in hospitals and catering. During the year there was a large increase in the consumption for these purposes. There is indication that, with the increase in the number of factories in the area of supply of the Company, and the finer adjustment of heat treatment which is now possible, gas—the ideal fuel—will be used more widely and to a larger volume in the future than in the past. The progress of this Department is very satisfactory and promising.

Mains.

You will see from the accounts that £46,300 has been expended on new mains and services, and £81,575 has also been expended out of the revenue account for repairs, renewals, and maintenance of mains, which now amount to over 1,312 miles, over 36 miles having been laid during the past year. It is also of interest to know that a portion of 18-in. main has been laid which, in effect, will enable the Company to put gas from the Wandsworth Works into the holders at the Sutton Works. This will enable the manufacturing plant at the Sutton Works to be shut down, if desired, except for peak loads and to meet exceptional demands. The Company is now able to send gas manufactured at Wandsworth—the highest point in the north—to the most southern part of the district.

The Fleet.

It always gives me pleasure to speak of the fleet owned and managed by the Company. The steamers "Wimbledon," "Wandle," "Tolworth," and "Ewell" have continued to perform admirable service by delivering coals by the most economical means—that is to say, from the loading staiths of the collieries at North-East coast ports of England to Wandsworth direct. Many proprietors will have seen these steamers proceeding up or down the River Thames, and, like myself, they cannot fail to be impressed by their smart appearance and business-like air. Last year the four ships created a record by delivering to Wandsworth 442,791 tons of coal hewn by British miners. A record is also achieved by the Company in respect of the quantity of coal carbonized during 1938—viz., 437,799 tons. During the exceptionally bad weather of recent weeks—the worst experienced by our Commodore Captain in his forty years at sea—the masters, officers, and men of the four ships gave their best services to our Company, in spite of the adverse conditions.

New Plant at the Wandsworth Works.

At the General Meeting last year it was mentioned that a new installation of tower purifiers was being erected at Wandsworth, capable of dealing with 10 million cu.ft. of gas per day. These purifiers, although of an entirely new type in England, have been used for a few years on the Continent. It is pleasing to be able to report that, after several months' experience, the installation is performing all the work expected of it in an entirely satisfactory manner, and showing an economy and flexibility greater than the more usual type of plant. During the cold period previous to Christmas, these purifiers were dealing satisfactorily with an amount of gas of about one-third more volume than guaranteed.

Additional carbonizing plant has been provided at the Wandsworth Works in the form of a further installation of intermittent chamber ovens, together with a large coke cleaning and screening plant. The plant is capable of producing 4 million cu.ft. of gas per day, with the coke resulting from the manufacture of this volume of gas. It is of interest to know that in the design of the plant consideration was given to the advisability of meeting the requirements of Air Raid Precautions, and this unit is entirely self-contained, with its own exhauster house, condensers, and other auxiliaries, making it an independent unit as regards manufacture and distribution to the purification plant.

Works Generally.

The proprietors may be quite satisfied that the whole of the works of the Company have been well maintained during the year, and are in a highly efficient condition for the maximum output of gas as and when required.

Co-Partnership.

In accordance with the provision of the Acts of the Company, the sum of £27,422, or an amount similar to last year, has been credited to the Co-Partnership Fund, and again I would like to express my firm belief in this system, which forms a valuable bond between the employees and the Company.

I will now propose formally:

> "That the Directors' Report and Statement of Accounts for the year ended 31st December, 1938, as audited and certified, be and are hereby approved and adopted."

After the resolution has been seconded, I shall be pleased to hear and answer any questions which the proprietors may wish to raise.

Mr. G. F. PAGE seconded the resolution, and, there being no questions, it was put to the meeting and carried unanimously.

Dividends.

On the proposition of the CHAIRMAN, seconded by Mr. E. SHERRARD, dividends as recommended in the Directors' report were declared—making, with the interim dividends already paid, total dividends for the year of 4% per annum on the 4% preference stock and 7% on the consolidated stock, both less income-tax.

Re-Election and Thanks.

The retiring Directors (Dr. T. A. I. Howell, and Messrs. G. F. Page and E. Sherrard) were re-elected, on the motion of the CHAIRMAN, seconded by Mr. R. M. CHART. The Chairman remarked that the services of all these gentlemen were extremely valuable to the Company.

The retiring Auditor (Mr. Bernard Hennell, F.C.A.) was thereafter re-appointed, on the proposition of Mr. PIERCE, seconded by Mr. O. B. GREEN.

The CHAIRMAN said it was a pleasure once again to express, on behalf of the Directors and himself—and he believed all the proprietors—appreciation of the work carried out by the staff throughout the past year. Mr. Croft "had a way with him," and was liked by everybody, and he was a hard-headed man of business, and had instilled his spirit into the whole of the undertaking. Past experience led them to expect a high standard of efficiency, co-operation, and loyalty from their staff, and last year was no exception to this rule. The staff had worked together hard and well, and he thought the results showed in the Balance-Sheet that their efforts had not been unavailing. The employees had again shown their loyalty to the Company and appreciation of the conditions under which they were employed. The Company had a fine body of men, who took the keenest interest in the prosperity of the undertaking, and, as the Co-Partnership Fund implied, they were partners in the progress of the Company. During the recent crisis, the whole of the staff and employees worked quietly and calmly together, and assisted in taking the precautions necessary with the same calmness and efficiency as when carrying out their normal duties. There had been a praiseworthy response to the call for volunteers for territorial and national services, but the proprietors would realize that,

while sparing every person possible for national service, the Directors and the Management of the Company would always have to bear in mind that a large proportion of the men's services must be retained for pursuing the functions of the Company and its duty to the public. Many, therefore, although willing to serve in outside operations, would be required to stand by for service inside the Company, which they would do as loyally and well as those who could be spared for other national service. He asked all present to unite in passing a cordial vote of thanks to those who had worked so ably in the service of the Company—from Mr. Croft right down to the most junior employee.

Mr. B. R. GREEN heartily seconded the vote, which was passed unanimously.

Mr. C. M. CROFT, M.Inst.C.E. (Chief Engineer and General Manager), returning thanks on behalf of himself and the staff and employees, said that, knowing the Chairman as he did, he was aware that such a vote proposed by him was not a mere formality, and he was sure that the proprietors also were sincere in passing it in the way they had done. Everyone in the service of the Company would feel grateful to them. He would like also, on behalf of the employees, to thank the Management for the provision of institutes and sports grounds and for everything they did in the interests of sport. This did much to keep the men fit, and to make of them good sportsmen, thus giving rise to that spirit of loyalty to which so much of the success of the Company was due. He would pass on the message of thanks to all employed by the Company.

The proceedings of the meeting concluded with a vote of thanks to the Chairman and Directors, which was proposed by Mr. PIERCE, seconded by Mr. BRADDOCK, and briefly acknowledged by the CHAIRMAN.

London Gas Undertakings (Regulations) Bill.

An Extraordinary General Meeting followed, at which the approval of the proprietors was given to a Bill which the Company, with certain other London Gas Companies, are promoting "To provide for the making of regulations with respect to the installation of supplies of gas and of gas-fired appliances to and in premises in the County of London, and matters incidental to such installations; and for other purposes."

The South Suburban Gas Company

The Annual Ordinary Meeting of the Proprietors of the Company was held at the Livesey Memorial Hall, Lower Sydenham, S.E., on Thursday, Feb. 16, 1939. Mr. FRANK H. JONES, M.Inst.C.E. (the Chairman), presided.

The GENERAL MANAGER AND SECRETARY (Mr. Tom Brown, B.Com.) read the notice convening the meeting; the Minutes of the last meeting were taken as read.

ADDRESS OF THE CHAIRMAN.

The CHAIRMAN: Ladies and Gentlemen,—With your permission, I propose to take the Report and Accounts, which have been circulated, as read. [Agreed.]

The Directorate.

Before proceeding to the detail of the accounts, I must refer to the loss which the Company has sustained since the last meeting by the deaths of Dr. Charles Carpenter and Mr. Harold Gundry. Dr. Carpenter became a Director of this Company in November, 1908, on the death of Sir George Livesey. He became Chairman of the Company in September, 1927, and was therefore a Director of the Company for thirty years, and Chairman for ten years. Dr. Carpenter will long be remembered for the practical application he gave to the principles of Co-partnership, and his great knowledge and ability were unsparingly devoted to the interests of the Company. Mr. Harold Gundry, who died at the end of December last, had been a Director for twenty-three years, and was much esteemed by his colleagues and the staff. The Directors have elected Dr. E. F. Armstrong and Mr. H. Fortescue Flannery to fill the vacancies thus created and feel that the knowledge and experience of these two gentlemen will be of great assistance to the Company.

Before proceeding further, I would ask all those present to rise for a moment in tribute to the memory of Dr. Carpenter and Mr. Gundry.

Gas and Appliance Sales.

The sales of gas during last year were adversely affected. The most important single factors affecting the sale of gas in our area are the weather and the number of additional consumers. In an area such as ours, which is mainly residential, and does not at the present time afford large opportunities for industrial sales, the effect of the weather on our business is considerable. Strange as it may seem, with the memory of the exceptionally cold weather just before Christmas fresh in our minds, last year was, on the whole, markedly warmer than the previous year. In addition, the rate of building development on our area has slowed down considerably during the last few years, with the result that, whereas in 1933 the additional consumers numbered 12,356, last year the additional consumers were 3,597. The Company now supplies well over 200,000 consumers in an area of about 250 square miles, and, as I pointed out last year, the normal growth in the number of our consumers has been of the order of nearly 70% over the last ten years. The crisis of last year, and the more unsettled conditions which prevailed generally, also had their effect on the development of business. The weather so far this year has been colder than for the corresponding period of last year, and this is satisfactorily reflected in our gas output.

I referred a few moments ago to the cold spell of weather just before Christmas. The demand for gas and coke then reached unprecedented heights, but I am glad to be able to say that there was no interruption in the continuity of supply or service rendered. The gas output increases we were handling at that time were of the order of about 30%, and December 21st established a new record for any single day's output. I think we may be justly proud of the reliability of our service.

It should be explained that during the year the Company changed from the monthly rendering of accounts to rendering them on a three-monthly basis with continuous meter reading. This meant that, at the end of last year, the gas consumption unread on consumers' meters was necessarily larger than at the end of the previous year. As a result of having to estimate this unread consumption, it may be that the actual sales of gas are somewhat better than appears to be the case.

Our sales of gas appliances last year were very little short of the record figures reached in 1937, and were higher than those for any previous year. As showing the continued popularity of gas for cooking purposes, I am pleased to be able to say that our sales of gas cookers reached a new high record last year. Considerable progress was also made during the year in the installation of large-scale cooking equipment at hotels, institutions, &c. Gas proves itself pre-eminent as a fuel for cooking purposes, not only on account of its price advantage, but also because of the superior results obtained due to more precise and easier control, greater reliability, &c.

Increased Demand for Coke.

In our business as purveyors of heat, coke also plays a very important part. Last year we sold to the public over 160,000 tons of coke, which created a new record, and of this nearly one-half was sold in direct trade to the actual user, largely in deliveries of a few hundredweights each. Coke as sold today is a very different product from the coke offered for sale twenty years or so ago. It now passes through various processes, so that it has become almost a refined product, sold to definite standards, and backed by a service organization which makes it the best and most economical fuel for open fires and boilers, in addition to which it has the overwhelming advantage of being smokeless.

Capital Expenditure.

Turning now to the Statement of Accounts, the Statements of Capital numbered 1 and 2 remain unchanged during the year. Statement No. 3 shows that substantial expenditure on Capital Account has been undertaken during the year, the greater part of this expenditure being classified as "Buildings, Lands, &c." This is largely accounted for by the installation of plant for the production of benzole, as referred to in the Directors' Report. This plant is now in operation, and benzole is being produced at all the Company's manufacturing stations, and also at Belvedere. It is proving to be a satisfactory revenue-earning asset.

and the production of about one million gallons of high-grade benzole, which is the Company's estimated output for this year, is also a contribution to national needs. In order to facilitate the manufacture of benzole, the calorific value of gas supplied by the Company in that part of its area excluding the Sevenoaks and Tonbridge areas, was reduced in November last from 560 to 545 B.Th.U. This alteration does not, of course, involve greater cost or less service to any consumer. The manufacture of benzole is also reflected in Statement No. 10, "Gas Made, Sold, &c.," which shows for the first time a figure of gas sold in respect of "Sundry Processes."

In addition, other plant of a revenue-producing character has been installed at the Sydenham Works, and the new holder and extensions to the retort-house and other plant at the Sevenoaks Works necessary to meet the rapidly growing demand there have been completed. The expenditure also includes the cost of a new depôt at Sydenham, which replaces two existing depôts; a new showroom at Northfleet, which replaces the former rented showroom; and part of the cost of the new showroom and offices being erected at Orpington.

While the capital expenditure in respect of buildings, land, &c., shows a high figure, the capital expenditure in respect of mains and meters shows a record low figure for the past few years, due mainly to the slowing down of building development on our area. An endeavour is made to deal with expenditure on mains on the basis of economics, and it is felt that this is a principle which could with advantage be more widely adopted. If allowance is made in respect of the assets which are separately revenue producing, so that a true comparison is made with gas capital assets only, it is found that the capital expended per therm shows only a fractionally small increase during the year.

Revenue Account.

Turning now to the Revenue Account (Statement No. 4), it will be seen that the amount shown under the heading of "Manufacture of Gas" is lower than for the previous year, and this is accounted for by economies which have been made and the reduced output. The expenditure under the heading "Distribution of Gas" covers a wide range of activities usually referred to as "District Work." It covers maintenance and repair of the 1,330 miles of main (and the services connected thereto) on our district, the service given to consumers through our seventeen showrooms and various local organizations and also provision necessary in respect of appliance facilities. As I have already explained, we have replaced our old showroom at Northfleet with a new building, and we are building new premises at Orpington to replace the accommodation there, which had become inadequate for our business in that growing and important area. In addition, we opened last week a new showroom at Penge, to provide additional facilities for our consumers. There was a net increase of just over 300 in the number of public lamps installed at the end of last year, the total increase in lighting power for 1938 being just over 6%.

The only other item in the Revenue Account showing any substantial variation is that in respect of "Rents, Rates and Taxes," where practically all the increase is in respect of additional Income-Tax liability. The items in the Net Revenue Account (Statement No. 5) follow very closely those of the previous year. The interest on Debenture Stock and the dividend on Preference Stock carry a full year's charge in respect of the stock issue made at the end of 1937, while the previous charge in respect of interest on temporary loans becomes this year a credit item.

Reserve and Special Purposes Funds.

The Reserve and Special Purposes Funds both show an amount of depreciation provided in respect of certain individual investments in these Funds, which at the date of the Balance-Sheet had a market value below the book value, although the total market value was in excess of total book value. It is our practice, however, always to write down any individual investment which may show a depreciation against market value at the date of the account, and never to write up any investment where the market value appreciates.

The Balance-Sheet.

There is little calling for comment in the Balance-Sheet (Statement No. 11). Cash at Bankers and in hand shows an increase over last year, and the Reserve and Special Purposes Fund are invested outside the business. Stocks of materials, &c., and accounts due to the Company both show substantial decreases, due largely to improvements in organization during the year which have freed additional working capital. The hire-purchase balance outstanding is arrived at after making due provision for reserve and interest, and the Superannuation Suspense Account is self-explanatory, and has been referred to on previous occasions. The Suspense Account on the other side of the Balance-Sheet includes provisions deemed necessary for renewals and depreciation.

Price of Gas.

I referred last year to the increased working costs we were experiencing, and pointed out that many costs showed increases of the order of 10 to 15%. In fact, in the case of such materials as wrought iron tubes, cast iron pipes, steel, &c., of which of necessity we use large quantities, the actual increased cost over the last few years is of the order of 40% or so. In the current year will be facing a large increase in the cost of our principal raw material—namely coal—and the cost of transporting it to our works. These additional charges in respect of coal, sea freights, and handling charges are of a substantial nature, and represent an increase in cost to us of about 0·7d. per therm. We cannot look for any contribution towards this increase from coke or other similar by-products, and the Board regretfully came to the conclusion that it would be necessary to pass ½d. per therm of this increase on to the consumer. They have, therefore, given notice that this revision of price will take effect from the first meter readings or slot meter collections on and after 1st March next. This small increase in price represents approximately 1d. per week in the case of the average domestic consumer, and makes the total increase in price over approximately the last ten years 0·9d. per therm. Representing, as it does, from about 1d. to less than 2d. per week in the case of the majority of our domestic consumers, this total increase is small in comparison with increases found necessary by other services. Nevertheless, the Directors regret the necessity for *any* increase, which they hope may prove to be of a temporary character only.

Air Raid Precautions.

The question of Air Raid Precautionary measures is actively engaging the attention of the Company. Such measures are necessarily of a costly nature, and it is earnestly hoped that the necessity for them will not arise. Nevertheless, it is imperative that all possible steps be taken to maintain supplies in case of emergency. The Co-partnership continues to operate satisfactorily, and the sickness and accident figures among our employees maintain a pleasingly low record. A new Suggestion Scheme was inaugurated last year, available to employees of all grades, and the response to that scheme has been very gratifying.

Gas Undertakings (Regulations) Bill.

The Directors' Report also refers to the Bill jointly promoted by the Companies supplying gas in the Metropolitan area which is now before Parliament, the short title of which is "London Gas Undertakings (Regulations) Act, 1939." An Extraordinary Meeting is being held on the conclusion of this meeting, for the purpose of submitting such Bill to the proprietors.

That, ladies and gentlemen, covers, I think, the salient features of the year's operations, and I now formally beg to propose that:

> "The Report of the Directors and the Accounts examined and signed by the Auditors be received, adopted, and the Report entered upon the Minutes."

I will ask Mr. B. R. Green, Deputy-Chairman, to second the resolution, and then the meeting will be open for discussion.

The DEPUTY CHAIRMAN (Mr. Benjamin R. Green) formally seconded the motion, and, there being no questions, it was put to the meeting by the Chairman, and declared carried unanimously.

The Dividends.

Proposed by the CHAIRMAN, and seconded by the DEPUTY-CHAIRMAN, it was agreed:

> "That Dividends for the Half-year ended 31st December last be now declared on the Ordinary Stock at 3%; on the 5% Perpetual Preference stock at 2½%; on the 4% Perpetual Preference Stock at 2%; and on the 3¼% Redeemable Preference Stock at 1⅞%; in each case less Income-Tax; making with the Dividends paid on 30th July, 1938, 6% for the year on the Ordinary Stock, 5% for the year on the 5% Perpetual Preference Stock; 4% for the year on the 4% Perpetual Preference Stock, and 3¼% for the year on the 3¼% Redeemable Preference Stock; all less Income-Tax, and that Warrants for the net amounts be forwarded on the 1st March next to the registered addresses of the Proprietors."

Re-Elections and Thanks.

The CHAIRMAN: I now have much pleasure in proposing the re-election of the two retiring Directors—Mr. B. R. Green and Mr. H. Fortescue Flannery. Mr. Green has served the Company well as a Director for a great many years; while in Mr. Flannery, who is a new member of the Board, you have a man of position who knows his job.

Mr. A. M. PADDON, M.Inst.C.E., seconded the resolution, which was agreed to.

The retiring Auditor (Mr. E. D. Davey, F.C.A.) was subsequently appointed.

The CHAIRMAN: I should next like to propose that the best

thanks of the meeting be given to everybody who works for the Company. It is a very happy Company.

The DEPUTY-CHAIRMAN: I have great pleasure in seconding that, for the vote is very well deserved. As an old campaigner, I know something of what such anxious times as these mean to both staff and employees.

Mr. TOM BROWN (acknowledging the vote of thanks which was cordially passed): Mr. Chairman, may I say that I know it would be the wish of all the employees that I should tender to you very sincere thanks for the kindly reference you have made to our efforts last year. What we did last year was the result of a team effort. We are proud of our team effort and we are determined to carry on and try to do the same next year. We hope, under your guidance, to be able to produce results next year as good as they are this year. [Applause.]

Mr. E. A. PIERCE: On behalf of all present, I should like to thank you, Sir, for the manner in which you have presided over this meeting, and also to propose a hearty vote of thanks to you and your co-Directors for all that you have done for the Company.

Mr. W. WASTELL: I second that vote with the greatest pleasure, and with a certain amount of personal gratification. It gives me an opportunity to say what came to my mind as soon as I saw this unfamiliar list of Directors on the back of the report and accounts. It is this—and I say it with the greatest respect, and in all sincerity: Much as those of us who knew both Dr. Carpenter and Mr. Gundry deplore that at a very ripe age they have at last gone, I think I can say without fear of contradiction that the Board of Directors of this important, progressive, and expanding Company is second to none among the gas undertakings of this country. The Board has experience and knowledge of what is required by a gas undertaking. The Directors are all of outstanding ability, and I am sure that the stockholders can rest assured that the interests of this great Company, which is so dear to the hearts of many of us, could not be better served. [Applause.]

The CHAIRMAN: On behalf of my fellow Directors and myself, I thank you very much.

Extraordinary Meeting.

At an Extraordinary Meeting held immediately afterwards, the proprietors signified their approval of the Bill "To provide for the making of regulations with respect to the installation of supplies of gas and of gas-fired appliances to and in premises in the County of London, and matters incidental to such installation: and for other purposes."

The CHAIRMAN, in moving the necessary resolution (which was seconded by the DEPUTY-CHAIRMAN), pointed out that the Bill was being promoted jointly by five of the big London Gas Companies, and that it had already been approved at meetings of the other four."

The Commercial Gas Company

The Annual Ordinary General Meeting of the Company was held at the Abercorn Rooms, Liverpool Street Station, London, E.C., on Thursday, Feb. 16, 1939—Mr. FRANK H. JONES, M.Inst.C.E. (the Chairman), presiding.

The SECRETARY (Mr. E. H. Harman, B.Sc.) read the notice convening the meeting, and the Company's seal was affixed to the Register of Stockholders.

THE CHAIRMAN'S ADDRESS.

Ladies and Gentlemen,—The Report and Accounts having been in your possession for some time, I will, with your permission, follow our usual practice and take them as read. [Agreed.]

The Late Dr. Charles Carpenter.

The Directors' Report refers with profound regret to the death of Dr. Charles Carpenter. This is not the place for me to detail his achievements. He was a great engineer and administrator, and the Gas Industry is the poorer for his passing. The Company feels his loss keenly, and those who were privileged to work with him know that, among the great men of the Gas Industry, he will not be easily, if ever, replaced. I know you will all wish to join with me in a message of profound sympathy to Mrs. Carpenter.

A Difficult Year.

I have to-day to place before you the record of a difficult year's working. The reduction of the recommended ordinary dividend from 5% to 4½%, while unfortunate, is, I feel, none the less necessary in the present difficult conditions—and even the reduced dividend has necessitated a transfer from the Reserve Fund.

The Company has this year suffered a loss in gas sold of nearly 6½%, representing some 185 million cu.ft. of gas. Of this loss, 67 million cu.ft. is attributable to only six of the Company's industrial consumers. As these consumers are to all intents and purposes using gas to the entire exclusion of any other fuel, this loss, which is consequent upon a reduced volume of trade, is beyond our control. In fact, general trade conditions this year have resulted in a substantial decrease in the quantity of gas sold for industrial purposes. This is all the more disappointing by reason of the continuous increase in industrial sales recorded for many years past.

Abnormal Temperatures.

The second factor which operated unfavourably was the weather. This annual review is no time to make excuses, but it is only fair to say that I cannot recall any year in which the weather reports have bristled so much with superlatives. The months of March and November were, in this respect, disastrous. The meteorological observations made at the Royal Observatory at Greenwich indicate that both March and November of 1938 were the warmest since records were begun, ninety-eight years ago, and that by a substantial margin. Our own works records show that the average temperature obtaining during March was 9° higher, and that during November was 7° higher, than for the corresponding months of the previous year. During those two months we lost 60 million cu.ft. of gas. The sharp cold spell during December, while very acceptable to the Company, was not of sufficient duration to lower the average temperature for that month, which was, if anything, a little higher than during the previous December. I should like to mention in passing that the Company met the abnormal demand during that cold spell with its usual efficiency.

Effect of Re-Housing.

The third factor militating against any expansion is the continuance of re-housing on the district. Now this, I know, is nearly a hardy annual, but I make no excuse for giving you a few figures illustrating the effect on the Company's business. In 1901 the population of the Boroughs of Stepney and Poplar was 467,000, and the estimated population during 1938 was 340,000—a decrease of 27%. Furthermore, it is estimated that the decrease in population from 1937 to 1938 was 8,200—a decrease of 2½% on the 1937 population. This figure is, of course, reflected in the number of meters in use, which have been reduced by a comparable percentage.

To those of you who are not familiar with the Company's district, the incidence of re-housing is hard to realize, but, as an illustration of its extent, I can quote the case of one area where 1,524 persons will be displaced from a site of nearly six acres. On this site accommodation will be provided for 1,065 persons, a reduction of 30% on the original number housed. In another case 750 gas meters have been disconnected for some months, and on the site 400 flats will be erected, giving a reduction of 46%. During the long period of clearance, demolition, and rebuilding, these sites are entirely unproductive, and considerable expenditure has to be incurred for new mains, services, and carcase pipes. Between thirty and forty acres within the area of the Company are at present in this transitional state, housing between 6,000 and 7,000 persons, according to present-day standards.

Increased Coal Prices.

These represent our difficulties during the past year, and they will doubtless be with us to a greater or lesser extent during the coming year. But there is one other burden which we are called upon to bear during the coming year, and which is of very serious moment to us. I refer to the increase in the price of coal. The powers conferred on the coal industry by the Coal Acts have been used to the full, and the Company is called upon to pay a very large increase in coal cost, and this after we had voluntarily paid an increase of 1s. per ton on existing contracts since the beginning of 1936.

Regrettable as it is, we have no alternative but to increase the

price of gas, and this we shall do as from the reading of the meter indices for the March quarter. The increase will be a small one—namely, 0·3d. per therm, which is 3%—and I trust that the Company's consumers will derive some consolation from the fact that the shareholders have this year suffered a drop of 10% in their basic return, which has been laid down by Parliament. I am told that the increase means to our average prepayment consumer 0·4d. per week. Since 1930 the ordinary dividend has been reduced from 6% to 4½%, a drop of 25%, although during that period the price of gas has only advanced from 9d. to 10d. per therm, an increase of 11%. Furthermore, our co-partners have received no bonus for the last four years. In the light of present-day conditions, however, we cannot do other than to put our consumers first.

Increased Appliance Sales.

I have so far only represented the debit side of the account, but there is also a credit side.

We have completely reconstructed our sales organization, which has resulted in an increase of appliance sales of 11% during the year, and we confidently expect a further improvement now that the Department has got into its stride. We have introduced the "C.G.C." cooker, which is a high-grade enamelled cooker supplied to prepayment consumers at a special rental. Some 6,000 consumers have already taken advantage of this offer, and the demand continues unabated.

Promotional Tariffs.

We have given very serious attention to modern methods of charging by two-part tariffs, and I am able to tell you that optional tariffs are now available to the various classes of consumers. That immediate benefit is not felt by the Company which launches an optional tariff is obvious, but we are conscious of a firmer hold of our consumers once they appreciate the working of the tariff.

We have, however, developed our tariff schemes rather further than this. Still more favourable terms are offered to those consumers who are willing to convert their homes to "all-gas" for cooking, heating, and water heating. There are special difficulties attaching to this particular scheme, since the great majority of our consumers are prepayment consumers, and the Company has thus to supply the apparatus. However, we are doing it, and I believe that it will be successful. We are supplying gas fires, a cooker, and a sink water heater as part of the installation, and the all-in standing charge is so moderate that, with gas at 4·85d. per therm, the total fuel cost of the average house is reduced and the degree of comfort and convenience materially increased.

Banishing Smoke and Soot.

By embracing the scheme, the consumer benefits not only himself, but also his neighbours, as his chimney no longer belches forth smoke. Smoke abatement is a subject which has been very much before the public eye during the last year. That a measure of smoke abatement is absolutely essential, if our town-dwellers and their children are to derive any real benefit from natural sunshine, none will dispute. Every year large sums are spent in combating the effects of the two-and-a-half million tons of soot which the domestic grate and the industrial chimney discharge annually into our atmosphere.

If the average citizen of East London could see the view over the house-tops on any cold day, and would think for a moment of just what that smoke pall means, I am sure he would realize that here was an evil which only he could eradicate. In our "All-Gas" Scheme we are giving him an opportunity to eliminate smoke from the East End of London, and to turn his house into what we have aptly termed a "Therm" house, with all that that implies.

The installation of Woodall-Duckham intermittent vertical chamber ovens at our Poplar Works, to which I referred in my speech a year ago, was completed during the year. Gas making commenced in November, too late to have any material effect upon our working results for the year 1938, but it is anticipated that the effect of the new plant will be reflected in the current year's working.

Capital Expenditure.

With regard to the Capital Account, some £6,000 has been expended on plant, and this is almost entirely in connexion with the new vertical chamber oven installation at Poplar. The £16,000 expended on stoves is consequent upon the supply of the "C.G.C." cookers, to which I have already referred. On the credit side will be found the proceeds from the two issues of stock made during the year, which enabled us to clear our temporary loan and further to invest our funds.

Revenue Account Figures.

There are only two items in the Revenue Account which are in themselves sufficiently outstanding to warrant mention. The first of these is under the heading "Repair and Maintenance of Works and Plant." This item shows an increase of £14,000 over the previous year, but since it includes a sum of £28,000 on account of the vertical chamber oven plant you will see that in reality an appreciable saving has been made. The second item is under "Repair and Renewal of Stoves." A saving of £5,000 is shown over last year, but since the expenditure includes a large sum on account of abnormal demolitions of returned stoves, a much greater saving than £5,000 has been effected. I must explain that the large number of returned stoves is consequent upon the "C.G.C." cooker campaign. These new cookers have become very popular and we have no alternative but to demolish the old stoves replaced, as it is unlikely that there will be any demand for them in the future.

You will see that it is necessary to transfer the sum of £4,668 15s. 2d. from the Reserve Fund in order to pay a final dividend of 2%.

The Balance-Sheet.

With regard to the Balance-Sheet, the item "Expenditure in Suspense" again calls for comment. It now appears as a much higher figure, but it includes the expenditure already incurred and the forward liability of, approximately, £23,000 in respect of the new plant at Poplar. The figure will be substantially reduced during the coming year. The value of appliances taken on hire-purchase during the year was £25,000. There were 2,158 stoves less at rental, but 3,595 appliances were sold during the year, so that there was a net increase of 1,437 on the district. This figure should be reduced by the number of consumers' own stoves scrapped, of which we have no knowledge.

I now formally move:

> "That the Report and Accounts be received, adopted, and entered on the Minutes."

Before, however, asking the Deputy-Chairman to second the resolution, I should just like to say that I do not want the shareholders of this Company to think that I have been talking in a pessimistic way. I have told you what I think is the truth about the Company. I personally am confident of the future, but we have to adapt ourselves to the new conditions. You cannot lose one-fourth of the population, and expect to be in exactly the same position as before, but I am quite sure that, with the help the Board receive from the staff, we shall be able to "fit the coat" to the business. In other words, if we cannot increase the business, we must adapt the Company to its reduced job. I wish to say for myself personally that I do not suppose there is a Chairman of any Gas Company who has got greater incentives than I have to do the best he can, and to get other people to do the best they can for the Company. I represent a large holding in the Company, and have the support of some very large shareholders. Apart, however, from financial considerations I have another great urge. I was born in the area of the Company. My father and grandfather worked in it, and your present Chairman is going to do all he can to put the Commercial Gas Company again in the happy position it occupied for so many years.

The DEPUTY-CHAIRMAN formally seconded the motion for the adoption of the report and accounts, and it was carried unanimously without discussion.

Dividend and Re-Elections.

Proposed by the CHAIRMAN and seconded by the DEPUTY-CHAIRMAN, it was agreed:

> "That pursuant to the recommendation of the Board of Directors, a Final Dividend be declared for the Year ended 31st December, 1938, at the rate of 2% on the Ordinary Stock of the Company, less Income-Tax, payable on the 17th February, and that warrants for the same be forwarded by post to the Proprietors."

The CHAIRMAN next proposed the re-election of the retiring Directors—Mr Stanley Hunter Jones, M.Inst.C.E., Mr. Harold Godfrey Palmer, and Mr. Harold Lawson Murphy, K.C. The first two gentlemen had, he said, served the proprietors well for a long time, and that Mr. Murphy also was going to look well after their interests they might be quite sure. Mr. Murphy was a Director of the South Metropolitan Gas Company, and he (the Chairman) thought no one could challenge the wisdom of the Board in asking him to become a Director of the Commercial Company.

The DEPUTY-CHAIRMAN seconded this, and it was agreed to.

Next the retiring Auditor (Mr. B. W. Ellis) was re-appointed, on the motion of Mr. F. J. BRADFIELD, seconded by Mr. H. F. HILLS.

Election of Employees' Directors.

The CHAIRMAN then proposed a resolution varying the Rules of the scheme for the election of Employees' Directors. He explained that, owing to the non-payment of bonus, which everybody regretted very much, the total holding of the employees would gradually reduce, and under this scheme this would ulti-

mately prevent one of the two Employees' Directors from remaining on the Board, and in time it might possibly prevent the other from sitting. The Directors were therefore asking the proprietors to reduce the present amount which the employees must hold to a lower figure. They suggested that while the employees held £50,000 there should be two Employees' Directors, and that if the amount fell to £25,000 there should be one. The Board urged the proprietors to assent to this, because they desired that the Employees' Directors should remain on the Board.

The DEPUTY-CHAIRMAN seconded the resolution to this effect, remarking that it was merely an equitable adjustment to the changed position of the Company.

The proposition was unanimously agreed to.

Votes of Thanks.

The CHAIRMAN proposed that the best thanks of the meeting be accorded to the staff and everybody who worked for the Company. One could not, he remarked, speak too highly of the working of the Company. No other company that he knew of had such a decrease in its business; but they would make the machine fit the job.

The DEPUTY-CHAIRMAN, in seconding the vote (which was cordially passed), said it must be obvious that, the greater the difficulties of the Company, the greater must have been the strain upon the executive officers. Every demand upon them, however, had been met to the full by the staff and employees.

Mr. A. E. WILLIAMS, M.Inst.C.E. (Chief Engineer), returned thanks on behalf of all those employed by the Company, who, he said, greatly appreciated this expression of confidence, which would encourage them during the coming year.

Mr. G W. ILSLEY, proposing a hearty vote of thanks to the Chairman and Directors, said the proprietors appreciated greatly what had been done for them, however much they might regret the reduction in the dividend. These slum clearances were, however, for the public good, and this Company happened to be suffering through no fault of its own. It was up to the proprietors to use their influence to get gas adopted in the new flats. There were still great prospects for the Gas Industry.

Mr. S. MADDOCKS seconded the vote, remarking that for fifty years he had attended every meeting of the Company, and was happy to think that its destinies were still in the hands of a member of the family who had done so much for it in the past.

The vote was heartily passed, and briefly acknowledged by the CHAIRMAN.

Extraordinary Meeting.

An Extraordinary Meeting followed, at which the proprietors approved of the Bill which is being promoted by five of the big London Gas Companies, including the Commercial, "to provide for the making of regulations with respect to the installation of supplies of gas and gas-fired appliances to and in premises in the County of London, and matters incidental to such installation; and for other purposes."

Portsmouth and Gosport Gas Company

The Annual Ordinary General Meeting of Portsmouth and Gosport Gas Company was held at the Company's Chief Offices, Guildhall Square, Portsmouth, on Feb. 16.

The Chairman (Alderman F. E. Beddow, D.Sc., Ph.D., J.P.), moving that the report of the Directors, which included the recommendation with regard to the payment of the usual dividends, and statement of accounts for the year ended Dec. 31, 1938, be adopted, said that under the provisions of the resolution passed at the Extraordinary General Meeting held on Feb. 17, 1938, an issue of loan capital was made in that month. This took the form of £125,000 3¼% debenture stock redeemable on Jan. 1, 1963, the price of issue being £101% and the total sum realized £126,250. On the debit side of that account, he continued, we have spent £69,130. On new buildings we have expended just over £1,300 more than in 1937.

The mains and service department has had an extremely busy year, as will be seen by the amount expended on new mains—namely, £31,868—an increase of almost £6,000 over the preceding year. This expenditure has been necessary to meet the ever-increasing demand for gas in the new building estates throughout the Company's area of supply.

The amount spent on meters—namely, £20,136—is £4,400 less than in 1937. The full statutory depreciation in respect of meters and gasholders, amounting to £17,843, has been written off during the year.

Increased Sales.

Turning to the Revenue Account, it is gratifying to be able to state that the quantity of gas sold during 1938 was 15,405,000 therms, of which 2,357,000 therms were consumed in the Gosport area. These figures represent increased sales in both areas of supply and the improvement is equal to over 2% for the whole Undertaking.

The total number of consumers is now over 99,000, or 2,500 more than a year ago. The income from the sale of gas has risen by approximately £15,000. This is attributable to two factors—the greater quantity of gas sold and the increase in the price of gas which took place on Oct. 1, 1938.

Receipts from appliances on simple hire are lower by approximately £1,900, but this was not unexpected, as during the year more than 8,000 cookers were sold to consumers on hire-purchase terms. The reduction would have been much greater but for the fact that in March last we decided to supply cookers at a rental which it was felt would meet the pocket of the average consumer.

We have had a very successful year with regard to the sale of residual products. It will be seen that the return shows a substantial increase over last year. The quantity of coke sold was almost identical with the 1937 sales but better prices were obtained. The popularity of the gas-ignited domestic coke fire is still increasing, and nearly 1,200 of these appliances were sold in 1938. Satisfactory sales of tar and benzole were recorded and the prices obtained were similar to 1937.

On the expenditure side under the heading of "manufacture of gas" it is not surprising to find an increase of £13,000 over 1937. Actually the figure here was considerably higher. In the first place, coal and oil are up by more than £15,000. Not only did we use about 7,000 tons more coal in 1938, but we had to pay a higher price for it, and the total quantity carbonized during the year was 183,000 tons.

Carbonizing wages show an increase of £2,200, which is accounted for by a revision of wages granted under a national award and the fact that 31,000,000 cu.ft. more coal gas was made during 1938, necessitating the bringing into use of additional coal carbonizing plant at the works.

The item "repairs and maintenance of works and plant" shows an apparent decrease of £5,270. Actually, the amount expended was considerably in excess of 1937. In the last annual report reference was made to the placing of a contract, amounting to £73,000, for replacement of the horizontal retort bench at Hilsea works by an intermittent vertical installation. Excellent progress has been made with this installation, and during 1938 £26,600 was paid to the contractors. This abnormal expenditure was partly met by drawing on our renewal fund to the extent of £11,250, and by charging against capital that portion of the amount representing improvement and extension of the plant.

We have spent £53,227 during 1938 upon repairs and renewals of mains and services. In consequence of the many housing schemes which have been commenced during 1938 we have put in approximately 32 miles of new services. This, in itself, is excellent testimony to the popularity of gas. It will be realized that while much of the cost of this work is not yet revenue producing, we shall benefit by increased sales in the near future.

The total distribution expenditure, spread over all items, is £9,000 up and this cost must increase with increasing number of consumers and the service we provide for them.

Management expenses are £20,779, or less by £1,000, and the remainder of the items and expenditure show little or no change and do not, I think, call for any comment, with the possible exception of £771, the expenses incurred in connexion with the issue of the 3¼% debenture stock.

The balance of profit for the year is £99,445, which is carried to the profit and loss account, where, after adding that amount to the credit side and debiting the charges for interest and income-tax, there is a balance of £78,924 available for dividend. The amount of the final dividend will absorb £35,013, leaving £43,910 to be carried forward, compared with £49,167 last year.

The results for the year, in spite of additional cost of coal and other materials and the full effect of increased wages, may be considered satisfactory. The cumulative effect of these increases, however, left us with no alternative but to increase the price of gas as from Oct. 1 last. I may say that some 18 months ago we had under consideration the question of revising the price, but it was decided to defer it as long as was prudently possible. Thus,

for 12 months, the Company has borne the burden of the increased working costs and has saved the consumers approximately £35,000.

Even with the addition of 0·6d. per therm, the highest rate charged to consumers in the City area is still as low as 7·6d. per therm, and in the case of the large consumer there is a graduated scale of prices in operation by which this figure is reduced to 4½d. per therm. These rates are among the lowest in the Gas Industry and, with one possible exception, are the most favourable in the South of England.

Whether any rise in price will be necessary after 1939 will be dependent upon the cost of coal and the proceeds from coke and other residuals remaining at their present figure. Only to a proportionately small extent will the 0·6d. per therm increase in the price of gas affect the stockholders.

Under the terms of the sliding scale as authorized by Parliament, so long as our price of gas remains at the revised figure of 7·6d. per therm to consumers in the City, the maximum rate of dividend payable on the consolidated stock will be £8 4s.% per annum, or a reduction of only 1s.% compared with the rate which has been paid since June, 1935.

For the past year, however, we are authorized to maintain the same dividend—*i.e.*, £8 5s.%—and it is, therefore, recommended that this rate be paid.

Basic Price.

While upon this subject, I think I ought to mention that the Directors have recently had under serious consideration the question of applying to the Board of Trade for powers to substitute a basic price and a basic dividend in place of the present sliding scale dividend.

It is also proposed, at the same time, to ask the Board of Trade for additional capital and borrowing powers. This is principally because of the large amount of capital which, during the past four years, has been expended in the development of our Undertaking and financing our successful hire-purchase business, for you will observe from the balance-sheet that the suspense account in this connexion has now reached the figure of £135,000.

The recent National crisis focused attention on the necessity for this country being in a position to produce, for munition purposes, the maximum possible quantity of benzole. The Directors are considering a scheme whereby the production of benzole will be largely increased in future. This is only one of the directions in which the Gas Industry will be indispensable from a national standpoint in the event of war.

During the year, emergency measures against air raids have exercised the minds of the Directors and these have progressed a good deal since August last. The key staffs at our several works are being trained in anti-war gas and decontamination operations and regular courses of tuition will be completed within the next few weeks.

For reasons of health and efficiency, there is a strong feeling in industry to-day that the number of annual holidays with pay granted to workers should be increased. In common with the larger gas undertakings throughout the country, we have decided that those workers who have been in our employ for a minimum period of two years shall be granted, in addition to a consecutive week's holiday each year, all the six national holidays, or other days in lieu thereof, making a total of 12 days' holiday per annum, with pay.

The Vice-Chairman (Mr. T. Carmichael, J.P., M.Inst.C.E.), seconding, referred to the new carbonizing plant at Hilsea. He said it was in an advanced stage of construction and would be put into commission this year. The workmanship was excellent.

The report and accounts were adopted, and the Chairman (Alderman Beddow) and Mr. W. H. Bennett were re-elected Directors.

Bristol Gas Company

The 139th Ordinary General Meeting of the Bristol Gas Company was held on Feb. 16 at the Company's Offices, Radiant House, Bristol—Mr. GEORGE H. BOUCHER (Chairman of Directors) presiding.

Mr. S. E. HALLIWELL (Secretary and Commercial Manager) read the notice convening the meeting.

The Chairman said: I assume that you will, as usual, take the Report of the Directors, and the Accounts, as read.

Once again I have to report another year of progress, both for the Gas Industry itself, and our own Company in particular. For many years past I have been able to report excellent progress in the history of the Industry, and the year 1938 is no exception to that rule.

As you know, we made an issue of Debenture Stock during the year 1938 and we were able to place the whole of it amongst our stockholders, by whom it was considerably over-subscribed.

We increased the number of consumers during the year by 4,013 until now it has reached the very large figure of 133,191. During the last 10 years there has been an average yearly increase of 4,000 consumers, so that the increase in 10 years has been just over 40,000.

Record Sales of Gas.

Our sale of gas last year shows another increase. It reached the record figure of 4,158,000,000 cu.ft., or an increase of nearly 70,000,000 cu.ft. compared with the year 1937. Since 1916 there has been an increase of over 50% in the amount of gas sold.

The effect of cold weather in these days of gas heating is very striking, as in the cold snap before Christmas last year we had five successive days, on each of which we sold more gas in the day than we had ever before sold in the history of the Company. I am glad to say that these abnormal demands for gas were met satisfactorily with regularity and certainty of supply.

The continual increase in the sale of gas is very gratifying to your Board, in view of the fact that competition was never greater than it is at the present time, and that all gas appliances are now constructed in such a way that there is a saving in the consumption of gas, with increased efficiency.

It is also very satisfactory to note that we have increased our sales in every department of our business. Sales of gas for domestic consumption have increased; the industrial demand has also been most satisfactory, and there has even been an increase in the sale of gas for street lighting.

I am sorry to say, however, that the City of Bristol has not been much help to us in this direction. It is the outside authorities who have realized the advantages of gas for public lighting.

In this connexion, I should like stockholders and our consumers to view the lighting of the approach to Temple Meads Station, in order that they may appreciate the value of gas for public lighting. It is a beautiful, safe, and efficient light, and the fact that many of the most important streets in London are lighted by gas is an example which might well be followed by local authorities who desire their cities to be lighted with a modern illuminant.

The number of gas cookers in use continues to increase. The number that we have supplied in our area amounted in 1938 to 113,297. This is very nearly double the number which were in use in 1916. These numbers do not include cookers sold by merchants. I can say with confidence that the increasing popularity of gas for cooking purposes is due to its reliability, efficiency, and economy.

The sale of gas appliances during the year has been well maintained. During the last three years we have sold over £600,000 worth of appliances, and there is no doubt our new showroom has contributed considerably to this wonderful result. Of course, many thousands of appliances have been sold, in addition, by local merchants acting in co-operation with this Company.

During the year we have laid 24 miles of mains and seven miles of services. We have now 659 miles of mains and 433 miles of services. In the last 10 years we have increased our mileage of mains by 192 miles. These figures are proof of the demand for gas in our area of supply, and of the expansion of Bristol.

Price of Coal.

I now come to the question of the price of gas. During the last few years we have been very fortunate in Bristol. Many gas undertakings, both municipal and company, have increased the price of gas at least once since 1936, while we have not found any alteration necessary.

This was largely the result of economical management, and of the policy of the Company in 1936 and 1937, in entering into contracts for the supply of coal at the lower charges for as long periods as could be arranged.

The prices have been increasing since 1935, but the full extent of the present price, which is 4s. to 5s. per ton higher than in 1935, was not effective in Bristol until October, 1938.

As our use of coal is between 200,000 and 250,000 tons per annum it will be appreciated what a serious charge this extra price entails on this undertaking, and we have, of course, no reserves in hand to meet such an abnormal increase in our charges.

which we estimate will be in the neighbourhood of £45,000 per annum.

In addition we have to provide for considerable increases in the cost of oil for manufacture, stores, material, and labour, while the revenue from the sale of tar is decreasing.

We have reluctantly decided to make a small adjustment in the price of gas supplied after March 31 next, so as to provide in part for the extra expenditure involved. We are proposing to make our normal price 8d. per therm, instead of 7·7d. per therm, which represents an increase of only just over ¼d. per therm.

In the individual case this is a negligible increase. To the domestic consumer using an average amount of gas it will mean asking him to pay about 3d. a month, or about 9d. per quarter more for his gas than in the past, and I am sure no consumer will object to this payment if, as apparently is the case, the increased cost of coal has brought peace in the coalfields. At 8d. per therm the price of gas in Bristol compares very favourably with other large cities in the country.

One very striking development during the past year was the considerable increase in our industrial gas sales. Manufacturers are beginning to realize that gas is the cheapest and best fuel for their varied requirements, and I am glad to say that the prospects for further increases in the industrial markets are most encouraging. Central heating by gas, and a new method of heating public buildings and works by radiant panel heaters, is now becoming extensively adopted.

I do not think it would be fair to omit some reference to our Home Service Section. Since the inauguration of this sphere of our activities at the end of 1935 the number of women visiting the showrooms in parties of 15 to 25 is over 10,000, and the visitors have been specially conducted round the showrooms by our staff.

This number represents 450 separate parties from 250 Women's Organizations, which are now directly associated with this Section. The Home Service Section has now a membership of nearly 7,000, and they receive regular invitation to the Company's special lectures and meetings.

Over 7,700 women have attended the private demonstrations in the showrooms, while 25,000 have attended the district demonstrations, many of which are held at the Meeting Rooms of the various organizations. The weekly lectures at the Little Theatre have had an average attendance of 400 to 500, and the total attendances since July, 1935, now exceed 30,000, making a total of 63,000 at the various practical demonstrations.

We have a staff of fully qualified Demonstrators, who systematically visit the homes of consumers to give practical talks and advice on the domestic uses of gas. There is an increasing demand for their services, and their duties have been carried out most satisfactorily.

During the year we have spent a considerable amount on our works and mains, and I can confidently say that the works are in most excellent order and have been most efficiently maintained.

The works staff is to be congratulated on the high level at which production has been maintained during the year.

Revenue Account.

When we come to examine the Revenue Account of the Company it will be seen that our profits are down on last year by some £9,000. This is due entirely to the increased cost of our raw material, particularly coal, and also to the extra amount we have had to pay for stores and labour.

On the other side of the account, gas sales show an increase, but the amount received for by-products shows a slight reduction owing to the decreased prices realized for tar during the year.

Our sales of coke have been quite satisfactory, and our graded coke sales are still increasing. In the year 1938 70,000 tons were sold, of which over 80% went to Bristol consumers.

Ammoniacal liquor still shows a debit instead of a credit, but we have recently made new arrangements for the disposal of the ammonia products, from which we expect, at any rate in the year 1940, to show a fair profit instead of a loss.

Stockholders will no doubt have noticed the propaganda which is now being employed by the railway companies for a remission of some of the obligations which have been imposed on them by Parliament. I sincerely trust that if the railway companies are successful in their demand for what they deem to be justice (as personally I think they ought to be) that the same measure of justice will be meted out to the gas undertakings.

In conclusion, on behalf of the Board may I once more thank Mr. Halliwell, Mr. Robertson, and their respective staffs for all the hard and onerous work which they have carried out during the year. The high reputation this Company possesses for courtesy, reliability, and service is due to the standard which the staff generally have set themselves in carrying out their duties not only as servants of the Undertaking, but as servants of the public.

The report and statement of accounts were unanimously adopted, and a dividend was declared for the half-year ended Dec. 31, 1938, at the rate of £5% per annum, subject to the deduction of income-tax, on the nominal capital of the Company.

The Croydon Gas Company

The Annual Ordinary General Meeting of the Croydon Gas Company was held on Friday, Feb. 17, at the Company's Temporary Offices, Barclay Road, Croydon—Mr. WILLIAM CASH, J.P., F.C.A. (Chairman of Directors), presiding.

The SECRETARY (Mr. Frank F. Wood, F.C.I.S.) read the notice convening the meeting.

THE CHAIRMAN'S ADDRESS.

Mr. CASH, moving the resolution for the adoption of the report and accounts for the year ended Dec. 31, 1938, first referred to the reason for their presence in that room on that occasion. He had told them a year ago that they had in contemplation the enlargement of their showrooms and offices in Katharine Street; and they had decided that it was essential for the efficient carrying on of their work to have temporary premises during the interval. They were convinced of the necessity for providing a new building—one which would be modern and would provide plenty of room, with a margin over and above their present requirements, to allow for the continued growth of the Company. When they saw the new building he felt sure they would agree that it was of a pleasing character and fully worthy of the Company. The Architect was Professor Newton, who was well-known in the architectural world.

The Accounts.

Turning to the accounts, the Chairman said that expenditure on land, new buildings, manufacturing plant, &c., in the capital account amounted to something over £40,000, the major portion of which had been spent on additional coal plant at the works and on two new showrooms—one at Coulsdon, which was opened on Jan. 30, and another at Selsdon, which would be opened in the near future. These two new showrooms were undoubtedly wanted. The former premises served a rapidly growing district which was some distance from the previous nearest showrooms at Purley. The opening of the new premises had been very successful and seemed to have gratified Coulsdon consumers very much.

They had expended £12,600 on new mains, which represented an additional 11 miles, bringing the total mileage up to 604. That their showrooms were successful could be judged from the fact that sales of appliances had again exceeded £100,000, though they were not quite so large as the figure for 1937.

It might also interest them to know that during the past year 2,618 new houses had been piped for gas, with an average of five points in each house, making over 13,000 points in all. Of these, 6,411 were in rooms where gas fires would, no doubt, ultimately be installed. New consumers during the year totalled 2,065, and although the average consumption per consumer was slightly down this was somewhat deceptive because so many of the older and larger houses were being divided up into flats—so that there were now three consumers when there used only to be one. They now had 105,380 consumers.

On the total sales of gas they recorded a small increase of 0·336%. This did not sound very much; but, as Chairmen of other Gas Companies had remarked, 1938 had been an unsatisfactory year in the sense that, taken on the whole, it was distinctly mild. To give an example, in March the consumption compared with the corresponding month of the previous year showed a drop of 12·6%, while in November there was a drop of something like 11%. Against this they experienced in December an extraordinarily cold snap—to which he would refer again.

It was satisfactory to know that their business continued to increase in certain directions in an encouraging manner. In particular were they pushing gas for central heating, and last year's consumption for that class of heating exceeded 31,000,000 cu.ft. And while Croydon could hardly be described as an industrial

town, the consumption of gas for industrial purposes showed an increase of 10,000,000 cu.ft.—bringing the total consumption under this head up to 164,000,000 cu.ft. Although electricity was used to a considerable extent for public lighting in their area, the consumption of gas for this purpose amounted to 80,000,000 cu.ft.—an increase on the year of 5,000,000 cu.ft.

Referring to the cold spell at the end of December, Mr. Cash stated that on Dec. 21 they created a record of 10% greater output than any previous single day in the history of the Company, the amount being 17,500,000 cu.ft., while the same applied to the week as a whole. Apart from the gratification at being able to sell that very large quantity of gas, that week provided a practical test of what could be achieved with their existing plant and organization. The Directors were extremely pleased that they were able to maintain full pressure everywhere, and although there might have been one or two isolated complaints through no fault of their own, the total number was really negligible. He would like to bear testimony to the fact that the whole staff, on both works and district, worked extremely well under conditions of considerable pressure and difficulty.

Sales of appliances, both outright and on hire-purchase, showed increases of 2,793 cookers; 2,732 fires; 10,164 water heaters, of which 6,572 were sink heaters; and 680 refrigerators. So their Sales Department were undoubtedly doing well.

Revenue Account.

Turning to the revenue account, the Chairman observed that the figures were set out alongside those for the previous year; so it was not necessary for him to go through them in detail. He would, however, point out that coal and oil had cost them nearly £20,000 more than in the previous year. On the other hand, repairs and maintenance of works, plant, &c., were down by some £6,000. Repair and renewal of mains, services, &c., showed a considerable increase—nearly £11,000—due to some extent to supplying appliances. Rates and rents showed an increase of £1,706, while wages and salaries, taken in the aggregate, were up on the year by £4,500.

On the other side of the revenue account it would be seen that the receipts from the sale of gas were slightly less. In a number of cases they were selling gas under contract at special rates, and the receipts were therefore down by some £1,500. Rentals were similarly less as a result of increased hire-purchase business. Residuals showed a satisfactory increase of £22,000, which was a progressive increase over the last two years. Gas undertakings had been talking a great deal about increased cost of coal, and he had already pointed to the substantial sum involved on the debit side. It must be realized, however, that the real difficulty in this respect would arise during the current year.

It would be seen that the total expenditure was up by £33,000, while receipts were up by £20,000; so that there was a net drop of £13,000 on the amount carried to net revenue account.

In the net revenue account it would be seen that income-tax was up by £2,178, while the pension fund contribution was less by £1,000. They had transferred nothing on this occasion to the insurance fund account; and reference to this account would show that the interest had been added for the year amounting to £1,199, while payments in respect to compensations for accidents, &c., totalled £516. Expenditure on Air Raid Precautions amounted to £1,091, with the result that the insurance fund account was slightly less at the end of the year.

The renewal fund account was the next appropriation, and this year they had placed £12,000 instead of £20,000 to the credit of this account. Even allowing for this less amount, the account had gone up from £51,887 to £56,797 on the year. They endeavoured in the Croydon Company to work to a programme in this connexion. They had estimated their requirements for the next two years and considered that their immediate programme for renewals was covered so far as they could ascertain.

To sum up the whole position, they were proposing to pay the same dividend as previously, and, according to the report, they were adding £658 to the carry-forward and leaving £55,618—which was more than sufficient for six months' dividend.

That, said the Chairman, was a brief summary of what they had done during the past year; and he would now say a few words in regard to the year 1939. He had told them on previous occasions that they had forward contracts for coal. There would, however, be this year a very substantial increase in their expenditure under this heading—equivalent to something like £15,000. On the other hand, their pension fund was now very nearly solvent from an actuarial point of view, and it would not require the special allocations they had been making—certainly not to the same extent in the current year. Nor would they require to place the same amount to renewal fund as they had done in 1938.

The other matter which naturally struck the eye was the residual market. There they had done very well, partly as a result of nearly doubling their output of benzole, which was a profitable market and should do as well in the present year as it had during the past. Capital expenditure would go on naturally as their business continued to expand; they would have to meet the cost of their new offices and showrooms, extensions to mains, and a new gasholder at Whyteleafe. The cost of coal they could not control; nor the market for residuals. And this naturally brought them to the question of whether to increase the price of gas. They did *not* propose to do so at the moment—and they would only do so if it was absolutely essential. More than that he could not say at the moment.

Future Outlook.

Reviewing the future outlook generally, the Chairman observed that their business consisted in the supply of light, heat and power; but their principal business lay in the supply of heat. They had been extending the use of gas for water heating to a large extent, and there were many ways in which they were promoting their service and maintenance in this direction through their sales organization. They were endeavouring to provide a first-class service for their consumers.

Speaking personally, he had every confidence in the future of the Gas Industry as a whole and in the Croydon Company in particular. He ventured to claim that the Company was well established, well organized, and well administered; and when he said that he referred to the officers and staff in general. Their works results compared favourably with any other undertaking, while their financial position might be said to be both sound and strong. Their total reserves amounted to more than a quarter of a million pounds; the position of the pension fund was very gratifying, and their price of gas, having regard to recent increases announced elsewhere, was to-day below that of the London Companies and their immediate neighbours.

He should, perhaps, inform them that the Order which they had sanctioned a year ago had been approved by the Board of Trade last July, giving them further capital powers which were necessary as their business grew, and that would be dealt with at the Extraordinary General Meeting which was to follow.

In conclusion, the Chairman spoke of the excellent work done during the past year by the officers and staff; their keenness and thoroughness were all that the Directors could expect. The spirit of co-partnership which had always existed in the Company was one of the strongest features of their organization.

Mr. Cash exhibited for the proprietors' inspection an elevation of the proposed new offices and showrooms in Katharine Street, remarking that it was a type of building which was modern without being eccentric. He then formally moved the resolution for the adoption of the report and accounts.

The DEPUTY-CHAIRMAN (Mr. Henry Woodall, J.P., M.Inst.C.E.), seconding the resolution, said that the Chairman had given them his usual very clear and full picture of the activities of the Company during the past year. He had told them about the results they had obtained, and Mr. Woodall thought it would be agreed that they were eminently satisfactory. Results such as these could only be obtained by keeping the whole of the plant and everything else in thoroughly good order—and that they did; they were very particular about it. Reference to the accounts would show that they had spent a good deal of money on those particular items. The revenue account indicated that they had expended altogether about three-quarters of a million pounds and nearly a quarter of a million on the four principal items—namely, works, £74,000; mains, services, &c., £80,000; meters, £31,000; and stoves, £50,000—which showed that they were maintaining their property in first-class order. He would add that their works were very good indeed. He had had considerable experience of gas-works, and he was sure there was no better works than theirs in the Kingdom—which reflected great credit on their Engineer and his staff.

Dividends.

The report and accounts were unanimously adopted; and on the proposition of the CHAIRMAN, seconded by Mr. HAROLD WILLIAMS, O.B.E., F.S.I., dividends for the half-year to Dec. 31, 1938, were declared as follows, all less income-tax:

On the Preference Stock at the rate of 4% per annum.
On the Maximum Dividend Stock at the rate of 5% per annum.
On the Sliding-Scale Stock at the rate of 7% per annum.

The retiring Directors (Mr. William Cash and Mr. Guy Savory) and the retiring Auditor (Lieut.-Col. W. C. Smith, D.S.O., M.C., F.C.A.) were unanimously re-elected; and the meeting terminated with cordial votes of thanks to the Chairman, Directors, officers, and staff.

Extraordinary General Meeting.

An Extraordinary General Meeting immediately followed to authorize the Directors to exercise the powers for the raising of additional capital authorized by the Croydon Gas Order, 1938.

Markets and Manufactures

Current Sales of Gas Products

The London Market

Feb. 20.

There are no alterations to record in the values of Tar Products in the London market, which remain as follows:

Pitch, nominal at about 30s. per ton f.o.b.

Creosote, about 3½d. to 3¾d.

Refined tar, 3¾d.

Pure toluole, about 2s. 3d.

Pure benzole, about 1s. 9d.

95/160 solvent naphtha, 1s. 7d. to 1s. 8d.

90/160 pyridine, 10s.

All per gallon naked at makers' works.

The Provinces

Feb. 20.

Crude Gas-Works Tar, 12s. to 17s.

To avoid misunderstanding, it is necessary to state that the above price is not claimed to represent a market value. It is a price worked out from week to week upon a system which has been used for many years as a basis for the fixing of certain contracts for crude tar of varying qualities in different areas.

The average prices of gas-works products during the week were: Pitch—East Coast, 29s. to 30s. f.o.b. West Coast—Manchester, Liverpool, Clyde, 29s. to 30s.* Toluole, naked, North, 1s. 7½d. to 1s. 9d. Coal tar, crude naphtha, in bulk, North, 7¾d. to 8¼d. Solvent naphtha, naked, North, 1s. 4½d. to 1s. 5d. Heavy naphtha, North, 1s. 2½d. to 1s. 3d. Creosote, *ex* works, in bulk, North, liquid and salty, 3¾d. to 4¼d.; low gravity, 4d. to 4½d. Carbolic acid, 60's, 1s. 7d. to 1s. 10d. Naphthalene, £13 10s. to £16. Salts, 70s. to 75s., bags included. Anthracene, "A" quality, 4½d. to 4¾d. per minimum 40% purely nominal; "B" quality unsaleable. Heavy oil: Unfiltered anthracene oil, min. gr. 1,080, 4¾d. to 4⅞d.; filtered anthracene oil, min. gr. 1,080, 5½d. to 5¾d.; heavy tar oil, gr. less than 1,080, 4¼d. to 4¾d.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls whatever they may be.

Scotland

GLASGOW, *Feb.* 18.

Market is still suffering from a lack of business but makers are maintaining their quotations.

Crude gas-works tar.—Actual value is about 34s. to 35s. per ton *ex* works in bulk.

Pitch of vertical quality is easy at 21s. to 22s. per ton f.o.b. for export and round 20s. per ton *ex* works in bulk for home trade.

Refined tar.—Prices for delivery in the home market during the coming season are fixed at 3¾d. to 4d. per gallon while, for export, quotations are about 2¾d. to 3d. per gallon, both into buyers' packages at makers' works.

Creosote oil.—Only a moderate volume of business is being conducted at the following prices: Specification oil, 3¾d. to 4d. per gallon; low gravity, 4¼d. to 4½d. per gallon; neutral oil, 3¾d. to 4d. per gallon; all *ex* works in bulk.

Cresylic acid.—There is still very little interest being taken in this product and supplies can be secured as under: Pale, 97/99%, 1s. 2d. to 1s. 3d. per gallon; dark, 97/99%, 1s. to 1s. 1d. per gallon; pale, 99/100%, 1s. 4d. to 1s. 7d. per gallon; all *ex* works in buyers' packages.

Crude naphtha is steady at 5½d. to 6d. per gallon *ex* works in bulk, according to quality.

Solvent naphtha.—90/160 grade is 1s. 3½d. to 1s. 4d. per gallon and 90/190 heavy naphtha is round 1s. 1d. to 1s. 1½d. per gallon.

Motor benzole is 1s. 3d. to 1s. 4d. per gallon.

Pyridine.—90/160 grade is 8s. 6d. to 9s. 6d. per gallon and 90/140 grade is 9s. 6d. to 10s. 6d. per gallon.

Benzole Prices

These are considered to be the market prices for benzole at the present time:

	s. d.		s. d.	
Crude benzole..	0 9½	to	0 10	per gall. at works
Motor „ ..	1 3	„	1 3½	„ „ „
90% „ ..	1 4	„	1 4½	„ „ „
Pure „ ..	1 8	„	1 8½	„ „

Contracts Advertised To-Day

Clock Controllers.
Middleton Gas Department. [p. 526.]

Coal.
Clacton Gas Department. [p. 525.]
Dewsbury Gas Department. [p. 525.]

Gas Oil.
Leeds Gas Department. [p. 526.]

Gasholder Repairs.
East Dereham Gas Department. [p. 526.]
Neath Gas Department. [p. 526.]
Rhondda Gas and Water Department. [p. 525.]

Meters.
Leeds Gas Department. [p. 526.]

Oxide of Iron.
Warrington Gas Department. [p. 526.]

Pipes and Specials.
Sidmouth Gas Department. [p. 525.]

Tar Still.
Warrington Gas Department. [p. 526.]

Dividend Announcements

Metropolitan Gas Company of Melbourne.—Messrs. William Coward & Co., advise us that they received a cablegram from their Principals, the Metropolitan Gas Company, of Melbourne, on Feb. 13, to the effect that the Directors have declared an Interim Dividend at the rate of 6s. 6d. Sterling per share, payable to-day.

Woking.—The Directors of the Woking District Gas Company recommended at the Annual General Meeting held on Feb. 14 dividends for the half-year ended Dec. 31, 1938, as follows: On the "A" Ordinary Stock, £11% per annum; on the "B" Ordinary Stock, £7 14s.% per annum; on the "C" Preference Stock, £5% per annum; and on the 4% Preference Stock, £4% per annum.

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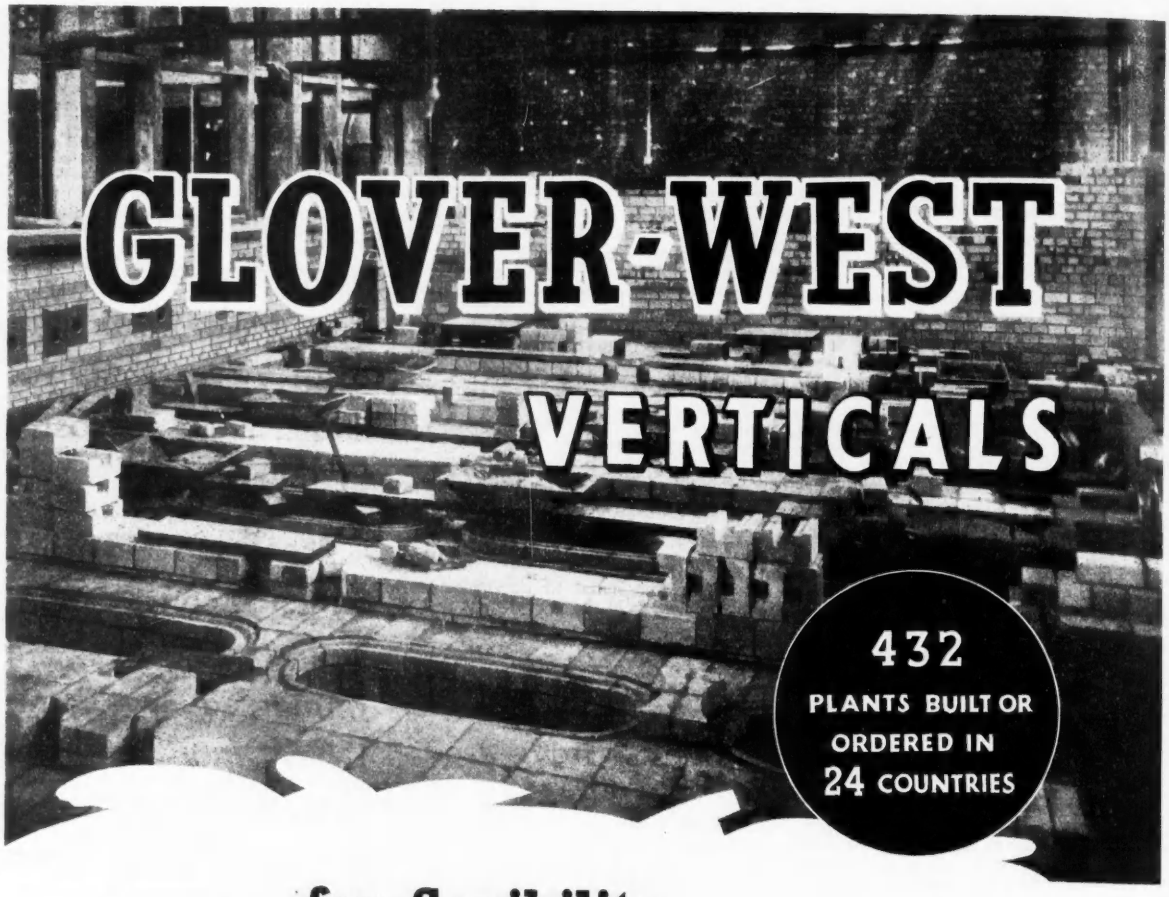

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GAS STOCKS AND SHARES

Although throughout the greater part of the last week the volume of business remained small, some increase developed towards the close, and the Account finished on Friday in cheerful fashion with prices generally moving upwards. The improved outlook is doubtless due to the strong impression formed in the City that the Government's colossal expenditure on defence has rendered war improbable. British Funds weakened on opening, but the later recovery almost brought up values to the previous week's levels. The L.N.E.R. statement caused a marking down of home rails, though these also benefited later from the brighter tone, and several stocks closed a point or two higher. Industrial shares were better supported and many of the leaders recorded useful gains. The rise in the price of the commodity led to more enquiries for rubber shares and oils generally were firmer with Mexican Eagles attracting the bulk of attention.

Unfortunately, the general position was not reflected in the gas market, as will be seen in the Stock and Share Lists below and overleaf. A number of the leading ordinary stocks reacted, including Gas Light units with a drop of 6d. to 21s. 6d., and Wandsworth with a fall of 4½ points to 130, while at Newcastle Hartlepool consolidated depreciated 12½ points to 70. These reactions were partly attributable to the weakness which developed in gilt-edged stocks during the early part of last week, but if the firmer tone which set in later continues during the current week a number of these losses will doubtless be made good.

Comparative high yields are now obtainable on gas "ordinaries," and below is a list of some of these now on offer. It should be noted that the rate of dividend shown has in all cases been paid for several years past:

Amount Offered.	——	Last Annual Dividend.	Price.	Gross Yield.
£		%		£ s. d.
500	Associated Gas and Water Undertakings	5	19/–	5 5 3
200	Bombay	8	24/–	6 13 4
1,000	British	7½	138	5 8 8
10,000	Gas Light units	£5 12s.	22/–	5 1 10
1,000	Imperial Continental	10	122	8 3 11
1,000	Newcastle units	5¾	23/–	5 2 2
2,000	South Western Gas and Water.. ..	5	18/	5 11 0
4,000	Swansea	5	94	5 6 4
5,000	United Kingdom Gas Corporation ..	5	19/–	5 5 0

Official Quotations on the London Stock Exchange

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Feb. 17.	Rise or Fall on Week.
1,767,439	Sept. 5	8	8	Alliance & Dublin Ord. ...	130—140	...
374,000	Dec. 19	4	4	Do. 4 p.c. Deb. ...	93—98	...
734,733	Nov. 7	5	5	Asscd. Gas & Water U'd'ts Ord.	17/—19/–	...
500,000	,,	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	19/—21/–	...
444,389	,,	4	4	Do. 4 p.c. Red. Cum. Pref.	19/—21/–	...
296,523	,,	4	4	Do. 4 p.c. Irred. Cum. Pref.	16/—18/–	...
500,000	Sept. 5	3½	3½	Do. 3½ p.c. Red. Deb. ...	93—98	...
560,070	Aug. 22	7	7	Barnet Ord. 7 p.c.	158—162	...
300,000	Oct. 10	1/9⅜	1/4⅜	Bombay, Ltd.	22/6—24/6	...
180,435	Aug. 22	9½	9½	Bournemouth sliding scale ...	195—205	...
690,526	,,	7	7	Do. 7 p.c. max. ...	157—162	...
493,960	,,	6	6	Do. 6 p.c. Pref. ...	130—135	...
50,000	Dec. 19	3	3	Do. 3 p.c. Deb. ...	75—80	...
362,025	,,	4	4	Do. 4 p.c. Deb. ...	96—101	...
335,000	,,	5	5	Do. 5 p.c. Deb. ...	113—118	...
357,900	Aug. 8	7½	7½	Brighton, &c., 6 p.c. Con. ...	143—148	...
659,955	,,	6½	6½	Do. 5 p.c. Con. ...	126—131	...
205,500	,,	6	6	Do. 6 p.c. 'B' Pref.	127—132	...
855,000	Sept. 19	8	7	British Ord.	132—137	...
100,000	Dec. 19	7	7	Do. 7 p.c. Pref.	138—143	...
350,000	,,	5½	5½	Do. 5½ p.c. 'B' Cum. Pref.	112—117	...
120,000	,,	4	4	Do. 4 p.c. Red. Deb. ...	95—100	...
450,000	,,	5	5	Do. 5 p.c. Red. Deb. ...	100—105	...
450,000	,,	3½	3½	Do. 3½ p.c. Red. Deb. ...	90—95	...
100,000	22May'33	6	4	Cape Town, Ltd.	1—2	...
100,000	6 Nov.'33	4½	4½	Do. 4½ p.c. Pref. ...	1—2	...
150,000	Dec. 19	4½	4½	Do. 4½ p.c. Deb. ...	60—70	...
626,860	Feb. 6	6	6	Cardiff Con. Ord.	116—121*	...
237,860	Dec. 19	5	5	Do. 5 p.c. Red. Deb. ...	103—108	...
98,936	Sept. 19	2/–	2/–	Colombo Ord.	1½—1¾	−¼
24,510	,,	1/4⅜	1/4⅜	Do. 7 p.c. Pref. ...	22/6—24/6	...
739,453	Oct. 10	–/11·48	–/11·48	Colonial Gas Assn. Ltd. Ord.	16/6—18/6	...
296,144	,,	1/3·30	1/3·30	Do. 8 p.c. Pref. ...	23/6—25/6	...
1,775,005	Jan. 23	5	4	Commercial Ord.	70—75	−2
140,000	Feb. 6	§13/4	4	Do. 4 p.c. Red. Pref. ...	95—100*	...
620,000	Dec. 5	3	3	Do. 3 p.c. Deb. ...	70—75	...
286,344	Aug. 22	5	5	Do. 5 p.c. Deb. ...	112—117	−1
200,000	,,	5¼	4	Do. 3½ p.c. Red. Deb. ...	97—102	...
807,560	Aug. 8	7	7	Croydon sliding scale ...	135—140	...
644,590	,,	5	5	Do. max. div.	100—105	...
620,385	Dec. 19	5	5	Do. 5 p.c. Deb. ...	112—117	...
239,000	Feb. 6	5	5	East Hull Ord. 5 p.c. ...	93—98*	...
186,155	Feb. 6	6	6	East Surrey Ord. 5 p.c. ...	113—118*	...
176,211	Dec. 5	5	5	Do. 5 p.c. Deb ...	112—117	...
250,000	Nov. 7	8	4	Gas Consolidation Ord. 'B' ...	19/—21/–	...
250,000	,,	4	4	Do. 4 p.c. Red. Cum. Pref.	17/6—19/6	...
19,189 963	Feb. 6	5⅞	5⅞	Gas Light & Coke Ord. ...	21/—22/–*	−–/6
2,600,000	,,	3½	3½	Do. 3½ p.c. max. ...	72—77*	...
4,477,106	,,	4	4	Do. 4 p.c. Con. Pref. ...	92—97*	...
2,993,000	Jan. 9	3½	3½	Do. 3½ p.c. Red. Pref. ...	93—98	...
8,602,497	Nov. 21	3	3	Do. 3 p.c. Con. Deb. ...	72—77	...
3,642,770	,,	5	5	Do. 5 p.c. Red. Deb. ...	108—112	−1
3,500,000	,,	4½	4½	Do. 4½ p.c. Red. Deb. ...	107—111	...
700,000	Sept. 5	3½	3½	Do. 3½ p.c. Red. Deb. ...	90—95	...
270,466	Aug. 22	6	6	Harrogate New Cons. ...	117—122	...
157,500	Mar. 21	1/2½	‡1/–	Hong Kong and China Ord. ...	§—⅞	...
213,200	Feb. 6	5⅝	6	Hornsey Con. 3½ p.c. ...	97—102*	...
5,600,000	Oct. 24	12	8	Imperial Continental Cap. ...	117—122	+1
172,810	Jan. 23	3½	3½	Do. 3½ p.c. Red. Deb. ...	96—101	...
235,242	Aug. 8	8½	8½	Lea Bridge 5 p.c. Ord. ...	160—165	...
63,480	Dec. 19	3	3	Maidstone 3 p.c. Deb. ...	69—74	...
45,000	Nov. 21	†10	†10	Malta & Mediterranean ...	130—135	...
				Metropolitan (of Melbourne)		
392,000	Oct. 3	5½	5½	5½ p.c. Red. Deb.	100—105	...
231,977	Aug. 22	5	5	M.S. Utility 'C' Cons. ...	98—103	−1
968,658	,,	4	4	Do. 4 p.c. Cons. Pref. ...	93—98	...
390,076	Dec. 19	4	4	M.S. Utility 4 p.c. Deb. ...	95—100	...
148,955	,,	5	5	Do. 5 p.c. Deb. ...	112—117	...
125,000	Jan. 3	3½	3½	Do. 3½ p.c. Red. Bds.	94—97	...
675,000	Nov. 21	†6	†6	Montevideo, Ltd.	70—75	...
250,000	Aug. 8	7½	7½	North Middlesex 6 p.c. Con.	142—147	...
396,160	Feb. 6	5	5	Northampton 5 p.c. max. ...	104—109*	...
300,000	Oct. 24	†7	†9	Oriental, Ltd.	145—150	...
468,537	Dec. 5	8	7½	Plymouth & Stonehouse 5 p.c.	130—140	...
621,667	Aug. 8	8½	8½	Portsmouth & Gosport Cons.	157—162	...
241,446	,,	5	5	Do. 5 p.c. max. ...	100—105	...
73,350	,,	5	5	Do. 5 p.c. Pref. ...	107—112	...
75,000	,,	4	4	Do. 4 p.c. Pref. ...	90—95	...
114,000	Feb. 6	5	5	Preston 5 p.c. Pref.	105—110*	...
247,966	Dec. 19	4	4	Primitiva 4 p.c. Cons. Deb. ...	96—101	...
625,959	Jan. 9	4	4	Do. 4 p.c. Red. Deb. ...	94—99	...
15,000	Sept. 5	6	6	San Paulo 6 p.c. Cum. Pref. ...	8½—9	...
441,275	Sept. 19	1/1½	1/1½	Severn Val. Gas Cor. Ld. Ord.	20/6—22/6	...
460,810	Sept. 19	–/10½	–/10½	,, ,, 4½ p.c. Cum. Pref.	19/6—21/6	...
133,201	Aug. 22	5	8½	Shrewsbury 5 p.c. Ord. ...	143—148	...
9,000	June 3	4	‡4	South African Ord.	4½—5½	...
1,371,752	Aug. 22	1/2⅝	1/2⅝	South East'n Gas Cn. Ld. Ord.	21/6—23/6	...
871 636	,,	–/10½	–/10½	Do. 4½ p.c. Red. Cum. Pref.	19/—21/–	...
498,818	,,	4	4	Do. 4 p.c. Cum. Pref. ...	17/—19/–	...
450,000	Feb. 6	4	4	Do. 4 p.c. Deb.	96—101*	...
150,000	,,	3½	3½	Do. 3½ p.c. Red. Deb. ...	93—98*	...
6,709,895	Feb. 6	5	6	South Met. Ord.	100—103	−½
1,135,812	,,	6	6	Do. 6 p.c. Irred. Pref. ...	126—131*	...
850,000	,,	4	4	Do. 4 p.c. Irred. Pref. ...	92—97*	...
1,895,445	Dec. 19	3	3	Do. 3 p.c. Deb.	72—77	−1
1,000,000	Jan. 9	5	5	Do. 5 p.c. Red. Deb. ...	107—110	...
600,000	,,	§31/–	3½	Do. 3½ p.c. Red. Deb. ...	98—101	...
1,543,795	Jan. 23	6	6	South Suburban Ord. 5 p.c. ...	110—115	−1
512,825	,,	5	5	Do. 5 p.c. Pref.	105—110	−2
500,000	,,	4	4	Do. 4 p.c. Pref.	92—97	−1
250,000	,,	3½	3½	Do. 3½ p.c. Red. Pref. ...	91—96	...
888,587	Dec. 5	5	5	Do. 5 p.c. Deb.	112—117	−1
250,000	,,	4	4	Do. 4 p.c. Deb.	95—100	...
200,000	Feb. 6	3½	3½	Do. 3½ p.c. Red. Deb. ...	90—95*	...
427,859	Sept. 19	8½	9½	S. Western Gas & Water Ord.	16/—18/–	...
160,523	Oct. 10	–/10½	–/10½	Do. 4½ p.c. Red. Cum. Pf.	19/—21/–	...
110,000	Dec. 19	4	4	Do. 4 p.c. Red. Deb. ...	93—98	...
750,541	Feb. 6	5	5½	Southampton Ord. 5 p.c. ...	104—109*	...
148,836	Dec. 19	4	4	Do. 4 p.c. Deb.	93—98	...
350,000	Feb. 6	5½	5½	Swansea 5½ p.c. Red. Pref. ...	105—110*	...
200,000	Dec. 19	3½	3½	Do. 3½ p.c. Red. Deb. ...	92—97	...
1,076,490	Aug. 8	6½	6½	Tottenham and District Ord.	126—131	−1
409,835	,,	5½	5½	Do. 5½ p.c. Pref.	116—121	...
62,235	,,	5	5	Do. 5 p.c. Pref.	107—112	−1
334,615	Dec. 5	4	4	Do. 4 p.c. Deb.	95—100	...
85,701	Jan. 9	6	6	Tuscan 6 p.c. Red. Deb. ...	95—100	...
1,131,550	Aug. 22	6	4	U. Kingdom Gas Cor. Ord. ...	18/—19/–	...
1,051,280	Nov. 7	4½	4½	Do. 4½ p.c. 1st Cum. Pref.	19/—21/–	...
762,241	,,	4	4	Do. 4 p.c. 1st Red. Cum. Pf.	19/—21/–	...
745,263	Dec. 19	4½	4½	Do. 4½ p.c. 2nd Non-Cum. Pf.	15/6—17/6	...
1,066,186	Sept. 5	3½	3½	Do. 3½ p.c. Red. Deb. ...	96—99	...
375,689	Aug. 8	7	7	Uxbridge, &c., 5 p.c.	125—130	...
133,010	,,	5	5	Do. 5 p.c. Pref. ...	108—113	...
1,371,138	Jan. 23	7	7	Wandsworth Consolidated ...	125—135	−4½
2,525,768	,,	4	4	Do. 4 p.c. Pref.	92—97	−1
1,343,964	Dec. 19	5	5	Do. 5 p.c. Deb. ...	112—117	−1
383,745	,,	4	4	Do. 4 p.c. Deb. ...	95—100	...
400,000	,,	§25/–	3⅜	Do. 3⅜ p.c. Red. Deb. ...	96—101	...
558,342	Feb. 6	6⅞	6⅞	Watford and St. Albans Ord.	128—133*	...
200,000	,,	5	5	Do. 5 p.c. Pref. ...	106—111*	...
200,000	,,	5½	5½	Do. 5½ p.c. Pref. ...	112—117*	...
200,000	,,	§16/8	4	Do. 4 p.c. Red. Pref. ...	95—100*	...
200,000	Dec. 19	4	4	Do. 4 p.c. Red. Deb. ...	95—100	...
200,000	,,	3½	3½	Do. 3½ p.c. Red. Deb. ...	92—97	...

a.—The quotation is per £1 of stock. * Ex. div. † Paid free of income-tax. ‡ For year. § Actual.

Supplementary List and Provincial Exchanges overleaf.

STOCK AND SHARE LIST—Cont.

Supplementary List, not Officially Quoted, London

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Nominal Quotations Feb. 17.	Rise or Fall on Week.
202,152	Sept. 5	5	5	Ascot Ord.	101—106	...
128,182	Dec. 19	5	5	Do. 5 p.c. Pref.	107—112	...
31,035	Aug. 22	–/4	–/4	Associated Utilities 4 p.c. Pref.	16/—18/–	...
100,000	Dec. 19	3½	3½	Do. 3½ p.c. Red. Deb. ...	95—100	...
17,000	Aug. 22	8	8	Bognor Orig. Ord. 'A' ...	155—165	...
62,210	,,	8	8	Do. New Addl. 'A' ...	155—165	...
87,160	,,	7	7	Do. New 7 p.c. max. ...	145—155	...
37,440	Feb. 6	10	10	Cam. Univ. & Town 10 p.c. max.	183—193*	...
125,970	,,	7	7	Do. 7 p.c. max.	131—136*	...
39,025	,,	5	5	Do. 5 p.c. max.	95—100*	...
96,410	Feb. 6	4½	4½	Cardiff 4½ p.c. Pref.	93—98*	...
150,000	Aug. 8	4	4	Croydon 4 p.c. Pref.	93—98	...
130 000	Dec. 19	4	4	Do. 4 p.c. Deb.	95—100	...
65,000	Aug. 8	8½	7½	Eastbourne 'A' 5 p.c. ...	140—145	...
198,000	,,	7	6	Do. 'B' 3½ p.c.	113—118	–1
112,312	,,	5	5	Do. 5 p.c. Pref.	107—112	...
130,000	Dec. 19	5	5	Do. 5 p.c. Deb.	110—115	...
24,000	Aug. 8	8½	8½	Great Yarmouth 8½ p.c. max.	43—48	...
59,400	,,	7½	7½	Do. 7½ p.c. max.	33—38	...
51,160	Dec. 5	5½	5½	Do. 5½ p.c. Deb.	117—122	...
152,600	Sept. 5	9	8	Guildford Cons.	163—168	...
54,055	,,	5	5	Do. 5 p.c. Pref.	105—110	–2
68,250	Dec. 19	5	5	Do. 5 p.c. Deb.	108—113	–2
156,600	Aug. 22	7½	7½	Hampton Court Cons. ...	126—131	...
80,000	Aug. 8	4	4	Lea Bridge 4 p.c. Pref. ...	90—95	...
60,000	,,	6	6	Do. 6 p.c. Pref.	121—126	...
94,876	Dec. 5	4	4	Do. 4 p.c. Deb.	94—99	...
73,620	Sept. 5	8⅝	8⅝	Luton Cons. 'A'	153—163	...
107,960	Sept. 19	5½	4	Mid Kent Ord.	8½—9½	...
230,940	Feb. 6	10	10	Oxford & District Ord. ...	192—197*	...
47,112	,,	5	5	Do. 5 p.c. Pref.	104—109*	...
50,000	,,	6	6	Do. 6 p.c. Red. Pref. ...	108—113*	...
126,193	Nov. 7	7½	7½	Peterborough Ord.	137—142	...
64,990	Sept. 5	6½	7½	Redditch Ord....	118—128	...
166,850	Feb. 6	8	8	Romford Ord....	142—147*	...
60,000	,,	4	4	Do. 4 p.c. Pref.	97—102*	...
44,000	Sept. 19	5	5	Do. 5 p.c. Deb.	110—115	–2
25,570	Feb. 6	5½	5½	Rugby 5½ p.c. Pref.	118—123*	...
25,000	,,	6	6	Do. 6 p.c. Red. Pref. ...	103—108*	...
42,750	Dec. 5	5½	5½	Do. 5½ p.c. Deb.	117—122	...
110,950	Aug. 22	8	8	Ryde Ord.	140—150	...
270,086	Sept. 5	7	7	Slough Ord.	128—133	...
21,000	Dec. 19	5	5	Do. 5 p.c. Deb.	107—112	–1
28,872	Nov. 7	5½	5½	S. Midland Gas Cpn. Ltd. Ord.	17/—19/–	...
28,866	Sept. 5	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	17/—19/–	...
117,228	Aug. 8	7	5	Swindon Cons.	102—107	...
60,425	Dec. 5	5	5	Do. 5 p.c. Deb.	110—115	...
64,380	Dec. 19	5	5	Torquay & Paignton 5 p.c. Pref.	105—110	...
130,000	Feb. 6	5	8	Wakefield Ord.	116—121*	...
81,650	,,	5	5	Do. 5 p.c. max.	92—97*	–8
82,000	Jan. 23	6	6	Weymouth Ord.	101—106	...
98,384	Feb. 6	6	6	Wolverhampton 6 p.c. Pref.	117—122*	...
160,000	Dec. 19	5½	5½	Do. 5½ p.c. Rd. Db.	103—108	...
90,000	Dec. 19	5	5	York 5 p.c. Red. Deb. ...	103—108	...
133,640	July 18	6½	6½	Yorktown (Cam.) 5 p.c. Cons.	118—123	...
120,000	,,	5	5	Do. 5 p.c. Pref.	105—110	...
35,000	Dec. 5	5½	5½	Do. 5½ p.c. Deb.	115—120	–2

BRISTOL EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Feb. 17.	Rise or Fall on Week.
347,756	Feb. 6	5	6	Bath Cons.	115—117*	...
1,667,250	Feb. 6	5	5	Bristol, 5 p.c. max.	109½—111½*	...
120,420	Dec. 19	4	4	Do. 1st 4 p.c. Deb. ...	98—101	...
217,870	,,	4	4	Do. 2nd 4 p.c. Deb. ...	98—101	...
328,790	,,	5	5	Do. 5 p.c. Deb.	117—120	...
274,000	Aug. 8	5	5	Newport (Mon.) 5 p.c. max. ...	97—99	...
13,200	Sept. 19	8⅔	7	Pontyp'l Gas & W. 10 p.c. 'A'	12½—13½	...
13,600	,,	6	5	Do. 7 p.c. 'B' ...	11½—12½	...
40,000	,,	6	5	Do. 7 p.c. 'C' ...	11½—12½	...
140,778	Feb. 6	5	5	Weston-super-Mare Cons. ...	104—106*	...
64,338	Dec. 19	4	4	Do. 4 p.c. Deb. ...	98—101	...
33,340	,,	7½	7½	Do. 7½ p.c. Deb. ...	149—152	...

LIVERPOOL EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Feb. 17.	Rise or Fall on Week.
157,150	Feb. 6	5	6½	Chester 5 p.c. Ord.	107—110*	...
92,500	Dec. 19	4	4	Do. 4 p.c. Pref.	95—99	...
36,430	,,	3½	3½	Do. 3½ p.c. Deb.	87—90	...
41,890	,,	4	4	Do. 4 p.c. Red. Deb. ...	97—101	...
2,167,410	Aug. 22	6	6	Liverpool 5 p.c. Ord.... ...	122—124	...
245,500	Dec. 19	5	5	Do. 5 p.c. Red. Pref. ...	100—105	...
306,083	Jan. 23	4	4	Do. 4 p.c. Deb.... ...	100—102	...
106,280	Feb. 6	10	10	Preston 'A' 10 p.c. ...	177—187*	...
188,219	,,	7	7	Do. 'B' 7 p.c.	129—139*	...

NEWCASTLE EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Feb. 17.	Rise or Fall on Week.
122,577	Aug. 8	8	8	Blyth 5 p.c. Ord.	160—162	...
732,000	Aug. 22	5	5	Hartlepool G. & W. Cn. & New	69—71	–12½
2,061,315	Feb. 6	5	5⅔	Newcastle & Gateshead Con.	22/6–23/–a*	...
682,856	,,	4	4	Do. 4 p.c. Pref. ...	98½—99½*	...
776,706	Dec. 19	3½	3½	Do. 3½ p.c. Deb. ...	88—89	–½
277,285	Oct. 24	5	5	Do. 5 p.c. Deb. '43 ...	103½—105½	...
332,351	Feb. 6	6	6	Sunderland 6 p.c. max. ...	132½—134½*	...

NOTTINGHAM EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Feb. 17.	Rise or Fall on Week.
542,270	Feb. 6	6	9	Derby Con.	132—137*	+2
55,000	Dec. 19	4	4	Do. 4 p.c. Deb. ...	100—105	...
20,000	Dec. 19	5	5	Long Eaton 5 p.c. Pref. ...	10—12	...
80,000	,,	5	5	Do. 5 p.c. Deb. ...	105—110	...

SHEFFIELD EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Feb. 17.	Rise or Fall on Week.
10,000	Feb. 6	10	10	Great Grimsby 'A' Ord. ...	205—215*	...
6,500	,,	10	10	Do. 'B' Ord. ...	205—215*	...
79,000	,,	10	10	Do. 'C' Ord. ...	195—205*	...
1,806,339	Aug. 22	6½	6½	Sheffield Cons.	139—141	...
95,000	Dec. 19	4	4	Do. 4 p.c. Deb.	100—102	...

a The quotation is per £1 of Stock.

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